

Cap and Run:

Toxic Coal Ash Left Behind by Big Polluters
Threatens Illinois Water



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EXECUTIVE SUMMARY

Illinois' coal-fired power plants, after decades of unsafe disposal of coal ash, have severely polluted the underlying groundwater. For the first time in 2018, utilities were forced to publicly report groundwater monitoring data on their websites because of new transparency requirements imposed by 2015 federal coal ash regulations. The Environmental Integrity Project (EIP), Earthjustice, Prairie Rivers Network, and Sierra Club, examined that data and determined that about 90 percent (22 of 24) of Illinois' reporting coal-fired power plants have contaminated groundwater with unsafe levels of one or more toxic pollutants.

These findings place Illinois at a crossroads: Will the State address the widespread pollution of its aquifers, and protect drinking water and nearby lakes and rivers, or will it continue to allow this toxic contamination to flow in perpetuity? Illinois began developing rules to protect against pollution from coal ash ponds in 2013, but those unfinished rules have sat abandoned for years, allowing pollution from those toxic ponds to continue to flow into rivers, lakes, and groundwater all around the State. Illinois must not wait any longer. It must take immediate action to protect families and waters from these dangerous dumps.

For decades, coal plant owners in Illinois operated disposed of millions of tons of toxic coal ash, primarily in unlined ponds, with little regulatory oversight by the Illinois Environmental Protection Agency (Illinois EPA) or the U.S. Environmental Protection Agency (EPA). Coal ash contains a brew of hazardous pollutants such as arsenic,

boron, cadmium, chromium, lead, radium, selenium and more, which can severely harm human health, fish and wildlife. The levels of multiple toxic pollutants found at Illinois plants exceed levels that are safe for human consumption.

The contamination revealed by the groundwater data is severe. The data, released earlier this year pursuant to a 2015 EPA regulation known as the "coal ash rule," show:

- At NRG-subsidary Midwest Generation's Waukegan Plant, on the shore of Lake Michigan, arsenic exceeds safe levels in groundwater monitoring wells by over two thousand times, boron is more than eleven times EPA's health threshold and more than sixteen times Illinois' drinking water standard, and chromium exceeds safe levels by more than four hundred and eighty times. Lithium, molybdenum, and sulfate also exceed safe levels many times over.

- At the Lincoln Stone Quarry on the banks of the Des Plaines River in Joliet – into which Midwest Generation dumped coal ash from its now-gas-fueled Joliet coal plants for decades – arsenic exceeds safe levels in groundwater monitoring wells by over twenty-three times, boron is seven times higher than EPA health thresholds, lithium exceeds safe levels by eight times, and molybdenum exceeds safe levels by eighteen times. Sulfate also exceeds safe levels, at fifty percent over EPA's health threshold.
- At Vistra subsidiary Dynegy's Hennepin coal plant, in the floodplain of the Illinois River downstream of Starved Rock State Park, arsenic and boron are more than three times higher than safe levels, and lithium reaches levels up to twelve times higher than what is safe. Other pollutants present at unsafe levels include cobalt, molybdenum, and selenium.
- At Dynegy's E.D. Edwards coal plant, located on the Illinois River just south of Peoria, arsenic in groundwater monitoring wells reaches nearly ten times safe levels, lead concentrations are eighteen times US EPA's drinking water standard, lithium is more than twenty times higher than safe levels, and cobalt is forty times higher than safe levels.
- At Midwest Generation's Powerton plant on the Illinois River just downstream of Peoria, arsenic exceeds safe levels by up to fifty times, and boron, cobalt and sulfate are also present at unsafe levels.
- At Dynegy's retired Vermilion coal plant on the Middle Fork of the Vermilion River – Illinois' only National Scenic River – upstream of the City of Danville, where ash-polluted groundwater is visibly seeping through the riverbank into the river, groundwater testing revealed boron at levels more than thirteen times EPA's health threshold and sulfate up to three times the EPA's health threshold.
- At Dynegy's now-shuttered Wood River coal plant, on the banks of the Mississippi River in Alton (Metro-east), arsenic in groundwater wells exceeds safe levels by six times, boron exceeds EPA health thresholds by twenty-three times, molybdenum is nearly nine times safe levels, and sulfate is nearly double EPA's health threshold.
- At Southern Illinois Power Cooperative's Marion plant, on the shores of Lake of Egypt in far-southern Marion, thallium (formerly used as rat poison) is up to one hundred and fifty times safe levels, and cobalt is seventy times higher than safe levels. Other pollutants present at unsafe concentrations include arsenic boron, lithium, and selenium.

Illinois' problems, however, extend far beyond the current contamination of groundwater at the power plant sites. Dynegy and Midwest Generation, LLC, which own the majority of the contaminated sites in the State, intend to close dozens of polluting ponds by leaving much of the coal ash in place ([see Attachment A](#)). Because these ash ponds are located close to lakes and rivers and are likely to continue to be inundated by groundwater, their contamination plumes will continue to flow into the State's waters. In addition, nearby many drinking water wells have not been tested or publicly posted, and it is possible that contamination may flow to communities who draw their drinking water from the affected aquifers and rivers.

The environmental impacts of contaminated groundwater come on top of the pollution that comes from permitted wastewater discharges at the same facilities. According to the most recent Clean Water Act permit applications on file with Illinois EPA, Illinois coal plants dump millions of pounds of pollution into lakes, rivers and streams each year, including over 300,000 pounds of aluminum, 600 pounds of arsenic, nearly 300,000 pounds of boron, over 200 pounds of cadmium, over 15,000 pounds of manganese, roughly 1,500 pounds of selenium, roughly 500,000 pounds of nitrogen, and nearly 40 million pounds of sulfate. These discharges bypass groundwater and go straight into surface water. The pollution discussed in this report migrates through groundwater, but often ends up in the same place. In the end, the two sources combine to create a massive load of toxic metals that harm aquatic life, make Illinois fish less safe to eat, and generally degrade Illinois' precious waterways.

As a result of the 2015 coal ash rule's monitoring and reporting requirements, we now know the severity of the coal plants' pollution of Illinois groundwater. Once groundwater is polluted, it is extremely difficult to stop the contamination unless the source of pollution is removed.

Currently, the owners of coal ash dumps in Illinois plan to leave much of that toxic coal ash in place. In the rare cases where they plan to excavate ash, the plan is often to add that ash to another neighboring coal ash dump that will be left in place. In short, in most cases, dangerous coal ash will be left where it now sits, continuing to pollute Illinois' waters for decades or centuries to come.

Our report presents a snapshot of the significant problem facing Illinois residents. Protection of the state's rivers, lakes and drinking water sources is within reach, if prudent steps are taken now by the State of Illinois to require companies to dig up coal ash dumped in unlined pits, clean up waters already polluted by coal ash, and strengthen safeguards against continued contamination from other coal ash dumps. This report includes specific recommendations to protect Illinois' waters. If the recommended actions are not taken, harm to Illinois' water resources will continue, and coal ash contamination will endanger the state's aquatic ecosystems and potentially the health of its residents for generations to come.



ASSESSMENT OF GROUNDWATER CONTAMINATION

KEY TAKEAWAYS

The Environmental Integrity Project and Earthjustice analyzed groundwater monitoring data from Illinois coal plants that became [publicly available](#) in March 2018 pursuant to the EPA's federal coal ash rule (also known as the coal combustion residuals rule or Coal Ash Rule).¹ Vistra subsidiary Dynegy, Inc., or NRG subsidiary Midwest Generation, LLC own most coal plants in Illinois. Dynegy and Midwest Generation provided groundwater data in a form that was difficult to understand, and consequently the data required technical and legal analysis that the groups recently completed. Groundwater data available for several coal plants not previously subject to the coal ash rule were also evaluated in this report.

We found unsafe groundwater contamination at **twenty-two of the twenty-four**² coal plants with available data. Each of the eighteen plants has unsafe levels of one or more of the following pollutants:

- **Arsenic**, which causes multiple types of cancer, neurological damage, and other health effects;
- **Boron**, which poses developmental risks to humans, such as low birth weight, and can result in stunted growth and plant toxicity in aquatic ecosystems;
- **Cadmium**, which can cause kidney and bone damage, is likely to cause cancer, and is toxic to aquatic life;
- **Chromium**, which can harm the liver and blood, and, in its hexavalent form, cause stomach cancer;

- **Cobalt**, which harms the heart, blood, thyroid, and other parts of the body;
- **Lead**, which causes severe neurological damage and is also categorized by the U.S. EPA as a “probable” carcinogen;
- **Lithium**, which presents multiple health risks including neurological impacts;
- **Manganese**, which is another known neurotoxin;
- **Molybdenum**, which damages the kidney and liver at high concentrations;
- **Selenium**, which harms fish and other aquatic organisms at very low concentrations and is bioaccumulative, and can also be toxic to humans;
- **Sulfate**, which causes diarrhea, and can lead to dangerous levels of dehydration in young children; and
- **Thallium**, which is associated with, among other things, reproductive and developmental risks.

We do not know the extent to which the tested groundwater is used for drinking, but regardless of use, these levels show that coal ash pollution has led to significant deterioration of the quality of groundwater – a resource that may one day be needed for drinking water if it is not already. Releases of these pollutants to the environment are particularly troublesome, because once they leach into groundwater the harmful pollutants do not go away or degrade over time.

As set forth in further detail below, Dynegy's closure plans for coal ash ponds in Illinois – as well as those for Southern Illinois Power Cooperative and City Water Power & Light – almost entirely entail dewatering and consolidation of coal ash on-site in preexisting ponds, then placement of a cover, or “cap,” on top of the waste. Most of those ponds are unlined³ and, under these closure plans, will remain unlined, leaving the coal ash exposed to groundwater. Further, merely “capping” these ash ponds means that these massive waste repositories will remain near rivers, lakes, streams and other water sources throughout the state – in perpetuity.

Although other ash pond owners, such as NRG-subsiary Midwest Generation, plan to close many of their ash ponds by “removing” (excavating) the ash contained therein, doing so will only partially address the problem of coal ash at those sites. For many years, coal ash at coal-fired power plants was simply dumped into unregulated pits around the plants, or used as “fill” to flatten ground or build dikes for ash ponds in which more coal ash was dumped. Until those old ash dumps and ash fill are excavated, toxic pollutants in that ash will continue leaching into Illinois' waters indefinitely.

EXPLANATION OF THE GROUNDWATER DATA DISCUSSED IN THIS REPORT

In 2015, the U.S. EPA finalized a regulation known as the “coal ash rule” or “CCR rule”⁴ or Coal Ash Rule in this report. The coal ash rule establishes design and operating criteria for owners and operators of certain coal ash ponds and coal ash landfills, and requires closure and/or corrective action at units that fail to meet the criteria.

Most of the groundwater data discussed in this report is data that the coal ash rule requires owners of coal ash dumps to gather.⁵ The coal ash rule requires groundwater monitoring in two phases. Phase one “detection” monitoring is intended to detect coal ash contamination by looking for early-warning coal ash indicators like boron and sulfate. If detection monitoring finds evidence of contamination, sites must initiate phase two “assessment” monitoring for a longer list of harmful constituents found in coal ash. If assessment monitoring yields further evidence of contamination – in the form of “statistically significant” increases in pollution in “downgradient” wells as compared to “upgradient” or “background” wells – then owners and operators are obligated to take steps to control the source of pollution

(the coal ash), remediate groundwater, and in some cases close ash ponds.

An August 2018 decision by the U.S. Court of Appeals for the District of Columbia significantly changed the relationship between groundwater data and unlined coal ash ponds, which make up more than 90% of all ash ponds.⁶ The court held that the rule's provisions allowing unlined coal ash ponds to continue operating unless and until monitoring reveals that the pond is polluting the groundwater do not adequately protect public health and the environment. The court sent the rule back to EPA to devise a different mechanism to protect against pollution from unlined ash ponds, leaving little, if any, room for EPA to do anything other than schedule the closure or “retrofit” (via installation of a protective liner)⁷ of those unlined ash ponds.

The groundwater data required by the rule suffer from one important limitation, which has to do with the rule's focus on a subset of individual coal ash dumps at each site. In some cases, both detection monitoring and assessment monitoring will fail to show statistically significant downgradient contamination – even if it exists – because the “upgradient” or “background” wells against which downgradient wells are compared are themselves polluted by coal ash. Contamination in upgradient wells often comes from unregulated coal ash dumps, such as long-abandoned coal ash landfills.

In other cases the background well is affected by the regulated coal ash pond or landfill, and is not in fact upgradient at all. This happens when a well is located too close to a unit, and/or when the groundwater flows away from the pond or landfill in all directions (because of groundwater “mounding” or the rise and fall of nearby waterbodies). Sadly, there are instances in Illinois of ash dump owners – including NRG-subsiary Midwest Generation – intentionally installing “background” wells in ash-contaminated areas, attempting to game the system to ensure that few, if any, statistically significant increases show up in their groundwater monitoring.

The solution to this problem is for Illinois to regulate coal ash contamination at the site level, rather than at the level of individual coal ash ponds or landfills. If groundwater at a coal plant shows coal ash contamination, the owner should be required to clean up that coal ash, regardless of whether the coal ash is in a pond or landfill regulated by

the coal ash rule. Illinois has the authority to go beyond the requirements of the coal ash rule, and should do so. Failure to address all sources of coal ash will fail to restore groundwater quality.

Notwithstanding the limitations of the groundwater data collected for the coal ash rule, the data remain vital to protecting Illinois' waters and all those who depend on them. First, under parts of the coal ash rule still standing after the recent court decision, the groundwater data continue to trigger "corrective action" – i.e., measures to stop further pollution and to clean up pollution that has already occurred – from coal ash landfills and lined

coal ash ponds. The rule also requires remediation of groundwater at sites affected by contamination from unlined ponds, even if they are closed in response to the recent court decision. Moreover, the results – though limited and incomplete – give us the most comprehensive glimpse ever available of the vast damage Illinois' many coal ash dumps have done, and continue to do, to our waters. They reveal the urgency and severity of the problem and underscore that Illinois must act now to stop further contamination.

The extent of groundwater polluted by coal ash in Illinois is so great that, despite ash dump owners'

TABLE 1: HEALTH-BASED THRESHOLDS AND GROUNDWATER PROTECTION STANDARDS USED IN THIS REPORT

	Health-based threshold	Illinois' Class I Groundwater Quality Standards ¹²	Presumptive groundwater protection standard under coal ash rule ¹³
Boron	3 mg/L	2 mg/L	NA
Chloride	NA	200 mg/L	NA
pH	NA	Between 6.5 and 9 ¹⁴	NA
Sulfate	500 mg/L	400 mg/L	NA
Total Dissolved Solids (TDS)	NA	1,200 mg/L	NA
Antimony	6 µg/L	6 µg/L	6 µg/L
Arsenic	10 µg/L	10 µg/L	10 µg/L
Barium	2 mg/L	2 mg/L	2 mg/L
Beryllium	4 µg/L	4 µg/L	4 µg/L
Cadmium	5 µg/L	5 µg/L	5 µg/L
Chromium	100 µg/L	100 µg/L	100 µg/L
Cobalt	6 µg/L	1000 µg/L	6 µg/L
Fluoride	4 mg/L	4 mg/L	4 mg/L
Lead	15 µg/L	7.5 µg/L	15 µg/L
Lithium	40 µg/L	NA	40 µg/L
Manganese	0.3 mg/L	0.15 mg/L	NA
Mercury	2 µg/L	2 µg/L	2 µg/L
Molybdenum¹⁵	100 µg/L	NA	100 µg/L
Selenium	50 µg/L	50 µg/L	50 µg/L
Thallium	2 µg/L	2 µg/L	2 µg/L
Radium 226 and 228 combined	5 pCi/L	NA	5 pCi/L

* NA INDICATES THAT NO STANDARD HAS BEEN SET

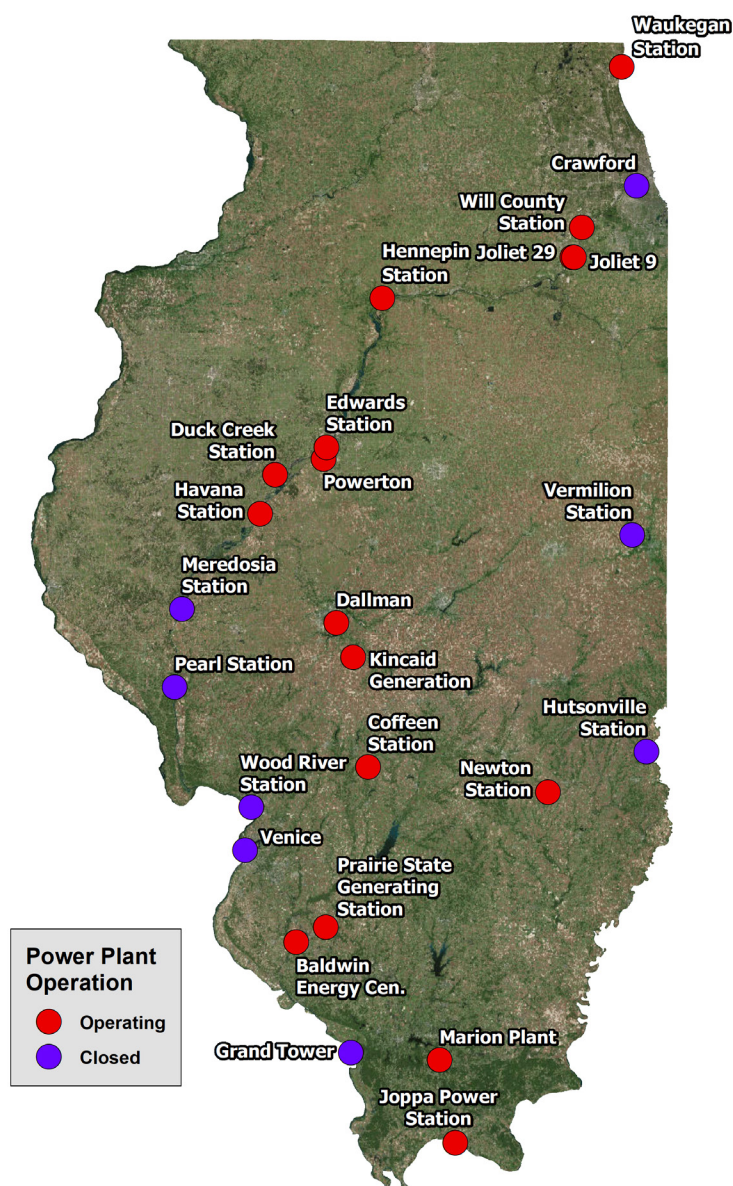


FIGURE 1: COAL ASH DUMPS IN ILLINOIS. RED PINS INDICATE AN ACTIVE COAL-FIRED POWER PLANT AT THE LOCATION; PURPLE PINS INDICATE RETIRED COAL PLANTS

attempts to game the system, assessment monitoring has been triggered at 25 coal ash dumps, including 2 lined ash ponds. That assessment monitoring will likely reveal significantly elevated levels of multiple coal ash pollutants, triggering the coal ash rule's requirement that owners of polluting ash landfills and lined ash ponds clean them up. Dynegy, Midwest Generation, and other owners of such landfills and lined ponds must follow through, quickly and comprehensively, with that cleanup. As for the dozens unlined coal ash ponds in the State, the extensive groundwater pollution revealed by owner companies' own monitoring reports prove that the D.C. Circuit court is right: unlined coal ash ponds pose a serious threat to our waters, and Illinois families need not wait for more monitoring to show that. Rather, Vistra subsidiary Dynegy,

NRG subsidiary Midwest Generation, and all other owners of unlined ash ponds in the State should immediately take steps to stop the contamination leaking from those ponds before expanding toxic groundwater plumes become more difficult, or impossible, to manage.

METHODS USED IN THIS REPORT

This report evaluates groundwater data in three ways. First, we compare groundwater data to health-based thresholds in order to determine whether the groundwater is unsafe. This determination includes both up- and downgradient wells because, as discussed above, many purportedly "upgradient" wells are affected by coal ash, either from a neighboring unit (regulated or unregulated), or in some cases from the unit being monitored. The thresholds that we used are shown in Table 1. For the most part, they are equal to EPA's presumptive groundwater protection standards for each pollutant. Boron and sulfate do not have groundwater protection standards under the Coal Ash Rule because they are not part of the assessment monitoring program (yet).⁸ For these two pollutants, we used EPA drinking water advisories.⁹ Manganese is also not part of the assessment monitoring program, so we used the lifetime health advisory level.¹⁰ We also compare groundwater data to Illinois' Class I groundwater quality standards, which apply to groundwater potentially suitable for drinking.

We consider a pollutant to be present at unsafe levels if the mean value exceeds the relevant health-based threshold.¹¹

We also evaluated each detection monitoring pollutant to see whether downgradient concentrations are likely to exceed upgradient concentrations, producing a Statistically Significant Increase (SSI) and triggering assessment monitoring. In some cases, owners acknowledged detection monitoring SSIs, either explicitly or by posting a notice of assessment monitoring. We did not attempt to calculate SSIs – each site has selected its own statistical method and the calculations would have been too onerous – but in order to get a sense of whether an SSI was likely, we compared the mean value of each pollutant in each downgradient well to the maximum upgradient value for the coal ash unit in question. We assume that when a pollutant is, on average, elevated above the maximum upgradient result, then that pollutant is significantly elevated. Monitoring results for detection monitoring pollutants are shown in [Attachment B](#). Finally, we evaluated assessment monitoring pollutants to

get a sense of whether assessment monitoring is likely to find SSIs. Strictly speaking, each owner will be using new data for their assessment monitoring analyses (i.e., data collected after the eight initial samples required by the coal ash rule). But we assume that groundwater quality will not improve significantly between, for example, 2016 and 2018, and that the initial sampling results provide a reliable indicator of current groundwater quality. If upgradient data for a given pollutant are all below that pollutant's groundwater protection standard, then we assume that the pollutant's groundwater protection standard is equal to the presumptive standard shown in Table 1. In this case, any downgradient result greater than the presumptive standard is a likely SSI. If upgradient data tend to exceed the presumptive groundwater standard for a given pollutant, then we assume that the standard for that pollutant will be set at background. In this case, we assume there will be an SSI if a mean downgradient concentration exceeds the upgradient maximum for that coal ash unit. Monitoring results for assessment monitoring pollutants are shown in [Attachment C](#).

In addition, where EIP's ashtracker database provides additional information, we summarize the data in [Attachment D](#) and in the text. The ashtracker data generally predate the Coal Ash Rule, were collected pursuant to state law requirements, and have variable coverage from site to site.

OVERVIEW OF COAL ASH IN ILLINOIS

Coal ash dumps litter the Land of Lincoln from north to south and east to west. There are ash dumps in Waukegan, in the State's farthest northern reaches, all the way down to Joppa, across the Ohio River from Kentucky. Dumps at Vermilion and Hutsonville approach Illinois' eastern border with Indiana, while coal ash dumps at Wood River and Venice menace our neighbors in Missouri in addition to Illinoisans.

These dumps are not local problems; they are harming groundwater, rivers, lakes and streams all across Illinois. As shown in Table 2, of 24 coal-fired power plants with coal ash ponds and landfills,¹⁶ active or retired, in the state, 22 have groundwater that has been contaminated by coal ash.

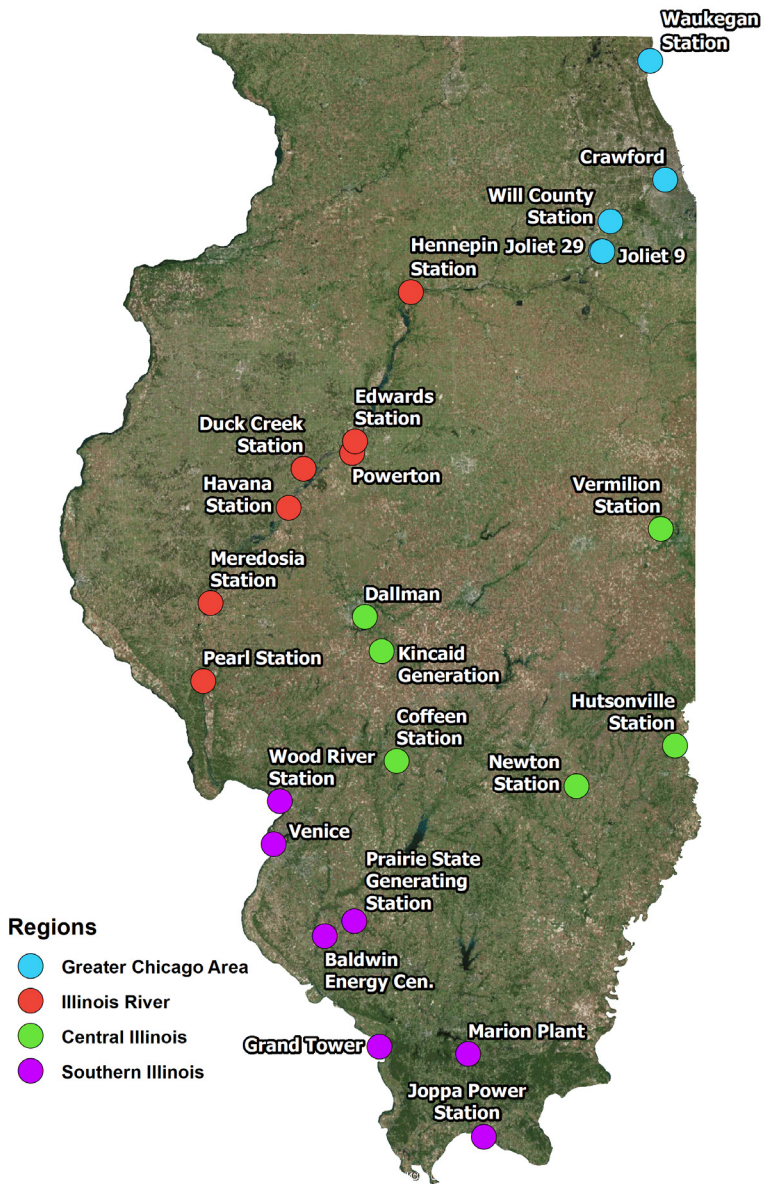


FIGURE 2: COAL ASH SITES IN THIS REPORT HAVE BEEN GROUPED INTO FOUR REGIONS – GREATER CHICAGO AREA, ILLINOIS RIVER, CENTRAL ILLINOIS, AND SOUTHERN ILLINOIS

GROUNDWATER CONTAMINATION DATA AND COAL ASH RULE COMPLIANCE BY SITE

As noted above, coal ash contaminates Illinois' waters all across the state. For ease of review, we have divided our analysis of Illinois' coal ash dumps into four regions, depicted below: Greater Chicago Area, Illinois River, Central Illinois, and Southern Illinois.

TABLE 2: COAL ASH DUMPS ACROSS ILLINOIS HAVE RENDERED GROUNDWATER UNSAFE

Site	Pollutants with mean concentrations greater than health-based thresholds in one or more monitoring wells
Baldwin	Arsenic, Boron, Cobalt, Lithium, Manganese, Sulfate
Coffeen	Arsenic, Boron, Cadmium, Cobalt, Lead, Lithium, Manganese, Sulfate,
Crawford*	Cobalt, Manganese, Sulfate ¹⁷
Dallman/Lakeside	Arsenic, Boron, Sulfate
Duck Creek	Arsenic, Boron, Cobalt, Lead, Lithium,
Edwards	Arsenic, Cobalt, Lead, Lithium,
Havana	-
Hennepin	Arsenic, Boron, Cobalt, Lithium, Molybdenum, Selenium
Hutsonville*	Boron, Manganese
Joliet 9	Arsenic, Boron, Lithium, Molybdenum, Sulfate
Joliet 29	Cobalt, Manganese, Sulfate
Joppa	Cobalt, Lead
Kincaid	-
Marion	Arsenic, Boron, Cobalt, Lithium, Selenium, Thallium
Merodosia*	Arsenic, Boron
Newton	Arsenic, Cobalt
Pearl*	Arsenic, Sulfate
Powerton	Arsenic, Boron, Cobalt, Manganese, Sulfate, Thallium
Prairie State	Arsenic, Cobalt, Lead
Venice*	Arsenic, Boron, Manganese, Sulfate
Vermilion*	Boron, Sulfate
Waukegan	Arsenic, Boron, Manganese, Chromium, Lithium, Molybdenum, Sulfate
Will County	Arsenic, Boron, Manganese, Sulfate
Wood River	Arsenic, Boron, Lithium, Molybdenum, Sulfate

*THESE POWER PLANTS WERE CLOSED BEFORE OCTOBER 2015 AND THEREFORE ARE CURRENTLY EXEMPT FROM THE COAL ASH RULE.



“The state needs to step up and protect our residents, our children, and our waters. What could be more important than that?”

—DULCE ORTIZ, WAUKEGAN



“For the generations to come we want the water to be safe. As young adults in today’s society we’re going to have to inherit what is left behind.”

—GIRL SCOUTS TROOP #6195, SPRINGFIELD



“I’m not interested in party affiliation, I am concerned with leaders who are interested in the quality of life for our children and grandchildren.”

—JO LAKOTA, PEORIA



“This is not a partisan issue at all. This is people, caring about their environment”

—GERMAINE LIGHT, DANVILLE



REGION 1: GREATER CHICAGO AREA

Lake Michigan is the water body that has defined Chicago as we know it. Lake Michigan provides drinking water for the city, and gives Chicago its beautiful lakefront, a draw of Chicagoans and tourists alike. The Lake helps support a thriving fishing industry and is home to many species of fish and wildlife. Water from the Lake is pumped into the Chicago Canal and over to the Des Plaines River, where it makes its way down to the Gulf of Mexico. The Des Plaines River provides is more than a shipping corridor, providing recreation and habitat, including the Des Plaines River Canoe & Kayak Marathon.

These water bodies both share a common problem—coal ash. The Waukegan Generation Station is located on the shores of Lake Michigan with two ash ponds, and the Des Plaines River is home to three more power stations—Will County Generation Station and Joliet 9 & 29, all with documented groundwater impacts.

1. WAUKEGAN

NRG subsidiary Midwest Generation owns and operates the 60-year old Waukegan Generating Station in Waukegan, on the shore of Lake Michigan. In addition to two unlined ash ponds, the property has a large, unlined coal ash landfill immediately west of the ash ponds to which the coal ash rule does not apply.¹⁸ One of the wells that Midwest Generation has designated as upgradient, MW-09, is located within the footprint of the onsite ash landfill, and almost certainly shows contamination from the landfill.

Through contamination from the coal ash landfill and possibly the ash ponds, the groundwater at Waukegan



WAUKEGAN COAL ASH PONDS

is unsafe, with dramatically elevated concentrations of multiple coal ash pollutants including arsenic, boron, chromium, lithium, molybdenum, and sulfate. Monitoring at the site has revealed extremely high concentrations of arsenic and chromium in one upgradient well, MW-14, which may be affected by coal ash and other sources of contamination. Arsenic levels in this well are hundreds of times greater than the groundwater standard, and chromium is up to 48 times its standard. Other pollutants are more directly related to coal ash contamination, including boron, lithium, molybdenum, and sulfate, which all exceed safe drinking water levels by large margins.

Additional data from EIP's ashtracker database cover a partially overlapping subset of onsite wells over the 2010-2015 time period. Two of these wells, MW-5 and MW-7, located between the ash landfill and the ash ponds, have the highest onsite concentrations of boron (30-50 mg/L) and sulfate (600-1,200 mg/L). The ashtracker data for Waukegan show unsafe levels of arsenic, boron, manganese, and/or sulfate in multiple wells.

[See Attachment D.](#)

1.1 Compliance

Even though the purportedly upgradient wells at Waukegan are contaminated, the downgradient wells show elevated concentrations of two detection monitoring pollutants, fluoride and pH, which suggests that the ash ponds are leaking. [See Attachment B.](#)

Midwest Generation therefore should be performing assessment monitoring at Waukegan, though it appears that it has not taken that step. Once in assessment monitoring, the groundwater at Waukegan would probably not show any SSIs due to the fact that both up- and downgradient wells have high levels of certain assessment monitoring pollutants.

Yet the site is clearly being contaminated by coal ash, even if much of it is coming from the unregulated coal ash landfill. This highlights an important failure of the coal ash rule. Without addressing older coal ash disposal units, the rule cannot effectively restore groundwater affected by coal ash. Waukegan will only be fully cleaned up if Illinois steps up, on a site-specific basis or through statewide

TABLE 1.1: THE GROUNDWATER AT WAUKEGAN IS UNSAFE FOR DRINKING

Well	Pollutant	Health threshold	Illinois Class I Groundwater Quality Standard	Mean concentration	Maximum concentration
MW-09*	Arsenic (µg/L)	10	10	12.2	60.0
	Boron (mg/L)	3	2	19.3	35.0
	Lithium (µg/L)	40		74.1	94.0
	Molybdenum (µg/L)	100		58	630
MW-11*	Arsenic (µg/L)	10	10	702.2	1,100.0
	Boron (mg/L)	3	2	3.1	5.2
	Lithium (µg/L)	40		44.8	57.0
MW-14*	Arsenic (µg/L)	10	10	5,930	21,000
	Chromium (µg/L)	100	100	1,838	4,800
MW-01	Arsenic (µg/L)	10	10	90.5	150.0
MW-02	Boron (mg/L)	3	2	3.4	4.2
MW-04	Arsenic (µg/L)	10	10	12.1	36.0
MW-16	Arsenic (µg/L)	10	10	11.7	43.0
	Boron (mg/L)	3	2	4.5	9.5
	Lithium (µg/L)	40		42.4	130.0
	Sulfate (mg/L)	500	400	537	990

* UPGRADIENT WELLS

rulemaking or legislation, to comprehensively address the coal ash contamination problem facing Illinois by regulating both active and inactive coal ash dumps.

1.2 The Closure Plans at Waukegan Are Unlikely to Stop the Contamination

Midwest Generation plans to close both ash ponds at Waukegan by removal. Removal of the ash from those two ponds is an important step towards limiting pollution at the site, but is not sufficient. Unless the ash is removed from the old, unregulated coal ash landfill at the site, that ash will continue to pollute Waukegan’s groundwater—and Lake Michigan, the drinking water source for Chicago and many other cities and towns—for centuries to come.

2. WILL COUNTY

Midwest Generation also owns and operates the Will County Generating Station in Romeoville, approximately 20 miles southwest of Chicago. Squeezed between the Des Plaines River and the Chicago Sanitary and Ship Canal, the site has four unlined ash ponds, known as ponds 1N, 1S, 2S, and 3S. Midwest Generation stopped using ponds 1N and 1S around 2010 and claims—we believe incorrectly¹⁹—that they are not subject to the coal ash rule. Midwest Generation does monitor the groundwater around all four coal ash ponds, but for the coal ash rule only reports the results of the monitoring wells around the site’s two active ash ponds, 2S and 3S.

An additional onsite source of contamination is a layer of coal ash between five and twelve feet thick buried in the ground along the eastern side of the ash ponds, partially saturated with groundwater.²⁰ One of the wells that Midwest Generation defines as upgradient is in fact installed within that fill layer (well MW-6).

Through contamination coming from the coal ash ponds

and the coal ash fill at Will County, the groundwater has unsafe levels of several coal ash constituents, including arsenic, boron, and sulfate. Groundwater at the site has arsenic five times safe levels, boron more than twice the health threshold and over three times Illinois’ standard, and sulfate one and a half times the health threshold and nearly twice Illinois’ standard.

As mentioned above, Table 19.1 only reflects contamination around two of the four onsite ash ponds, 2S and 3S. EIP’s ashtracker database includes data for wells around all four ponds, for the 2010-2015 time period. These data show unsafe levels of boron, manganese and sulfate in the groundwater around ponds 1N and 1S. [See Attachment D.](#)

2.1 Compliance

Since the wells that Midwest Generation identified as upgradient are affected by coal ash, there is virtually no statistical difference between up- and downgradient sampling results. This means that Midwest Generation probably did not find any SSIs during detection monitoring. This may explain why the site has not progressed to assessment monitoring. If Midwest Generation did conduct assessment monitoring at Will County, it would likely find SSIs for arsenic in wells MW-10 and MW-11, where mean concentrations are greater than the maximum upgradient concentration.

2.2 The Closure Plans at Will County Are Unlikely to Stop Contamination

Midwest Generation plans to close ash ponds 2S and 3S at Will County by removal. Removal of the ash from those two ponds is an important step towards limiting pollution at the site, but is not sufficient. Unless the ash is removed from the two other remaining coal ash ponds—1N and 1S—as well as the ash dumped as fill at

TABLE 2.1: THE GROUNDWATER AT WILL COUNTY GENERATING STATION IS UNSAFE FOR DRINKING

Well	Pollutant	Health threshold	Illinois Class I Groundwater Quality Standard	Mean concentration	Maximum concentration
MW-05*	Boron (mg/L)	3	2	4.3	6.1
	Sulfate (mg/L)	500	400	584	770
MW-06*	Boron (mg/L)	3	2	3.3	3.9
MW-10	Arsenic (µg/L)	10	10	20.2	50.0
	Boron (mg/L)	3	2	3.5	4.3

* UPGRADIENT WELLS

the site, the remaining coal ash will continue to pollute the groundwater at the Will County site for centuries to come.

3. CRAWFORD

The former Crawford Generating Station in Little Village, Chicago is not subject to the coal ash rule, but EIP’s Ashtracker database shows that the groundwater at Crawford is contaminated. Specifically, data from 2010-2012 show unsafe levels of cobalt, manganese, and sulfate in two onsite wells. See Attachment D. Illinois EPA reported in 2017 that the coal ash was “removed” (excavated) from Crawford’s coal ash pond prior to Oct. 2015,²¹ revealing that removal—the most protective closure option for most coal ash ponds—has been a viable option in Illinois. Groundwater data for Crawford post-closure by removal was not available to the authors of this report at the time of publication.

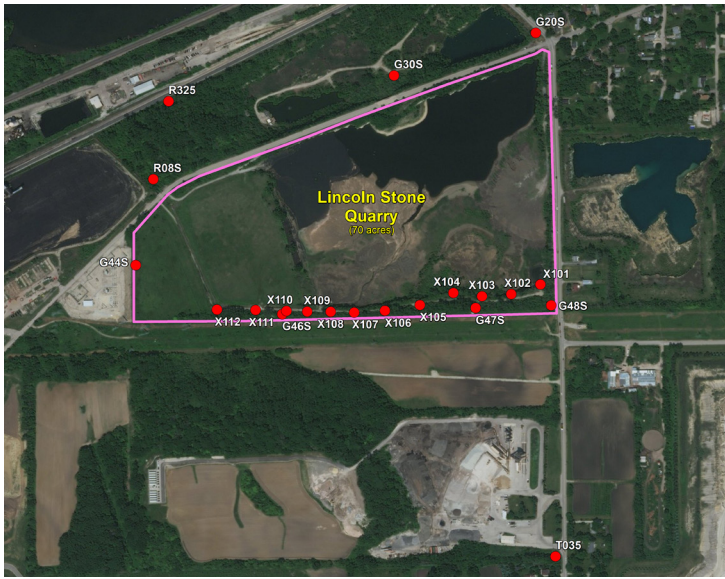
4. JOLIET 9

NRG subsidiary Midwest Generation operates two power plants on either side of the Des Plaines River in Joliet. The plant on the south side of the river is known as Joliet 9, and the plant on the north side of the River is known as Joliet 29 (see next section). Both were coal-fired power plants; since 2016, they burn natural gas. However, because they burned coal for decades, both have associated coal ash disposal sites. For purposes of the coal ash rule, Joliet 9 is sometimes referred to as the “Lincoln Stone Quarry,” which is the name of the site’s coal ash disposal unit.

The Lincoln Stone Quarry is, as the name suggests, an old quarry that is now filled with water and coal ash. This site is one of the most contaminated in Illinois, and due to local hydrology, the contamination from the quarry tends to flow south, away from the Des Plaines

TABLE 4.1: THE GROUNDWATER AT JOLIET 9 IS UNSAFE FOR DRINKING

Well	Pollutant	Health threshold	Illinois Class I Groundwater Quality Standard	Mean concentration	Maximum concentration
G30S	Arsenic (µg/L)	10	10	13.7	19.0
	Boron (mg/L)	3	2	6.4	11.0
	Molybdenum (µg/L)	100		291	450
G46S	Boron (mg/L)	3	2	6.3	7.9
	Lithium (µg/L)	40		104.1	130.0
	Molybdenum (µg/L)	100		994	1,800
G47S	Arsenic (µg/L)	10	10	108.0	230.0
	Boron (mg/L)	3	2	12.3	21.0
	Molybdenum (µg/L)	100		894	1,500
	Sulfate (mg/L)	500	400	565	780
G48S	Arsenic (µg/L)	10	10	31.7	46.0
	Boron (mg/L)	3	2	9.1	11.0
	Molybdenum (µg/L)	100		1,007	1,400
R08S	Boron (mg/L)	3	2	7.1	12.0
	Lithium (µg/L)	40		147.0	250.0
	Molybdenum (µg/L)	100		387	640
R32S	Boron (mg/L)	3	2	4.1	8.3
	Lithium (µg/L)	40		79.3	140.0
	Molybdenum (µg/L)	100		606	1,400



JOLIET 9 LINCOLN STONE QUARRY

River and towards residential areas. In order to prevent contamination of residential wells, Midwest Generation has had to install a pump-back system that extracts contaminated groundwater and pumps it back into the quarry.

The groundwater at Joliet 9 is unsafe, with arsenic at concentrations up to twenty-three times safe levels, boron at concentrations seven times the health threshold and more than ten times Illinois’ standard, lithium at concentrations more than eight times safe levels, molybdenum at concentrations eighteen times safe levels, and unsafe levels of sulfate.

4.1 Compliance

There is no question that the groundwater near the Lincoln Stone Quarry is being contaminated by coal ash, and Midwest Generation predictably found detection monitoring SSIs and initiated assessment monitoring.

TABLE 4.2: WELLS WITH LIKELY ASSESSMENT MONITORING SSIs AT JOLIET 9

Downgradient well	Pollutants exceeding likely groundwater standard
G20S	Lithium
G30S	Arsenic, Molybdenum
G46S	Lithium, Molybdenum
G47S	Arsenic, Molybdenum
G48S	Arsenic, Molybdenum
R08S	Lithium, Molybdenum
R32S	Lithium, Molybdenum

During assessment monitoring, Midwest Generation already has found SSIs—i.e., statistically significant increases in contamination above groundwater protection standard—for arsenic, lithium and molybdenum.

4.2 The Closure Plan at Joliet 9 is Unlikely to Stop Contamination

Midwest Generation is currently planning to close the quarry by leaving the ash in place. That will do nothing to stop toxic contamination from continuing to flow out of the quarry. The closure plan says nothing about whether, or for how long, the system currently in place to pump contaminated groundwater moving toward residential areas back into the quarry will continue to operate. Even if that pumping system remains in operation, the monitoring results make clear that it is not stopping contamination from moving offsite. In short, unless the coal ash is excavated from the Lincoln Stone Quarry, it will continue to pollute the groundwater both onsite and offsite for centuries to come.



JOLIET 29 COAL ASH PONDS

5. JOLIET 29

Midwest Generation operates the Joliet 29 station on the north side of the Des Plaines River in Joliet. The Joliet 29 property includes three ash ponds and two ash landfills, but the only unit covered by the Coal Ash Rule (according to Midwest Generation) is a single ash pond, Ash Pond 2.²²

Groundwater monitoring in the four wells around Ash Pond 2 has shown unsafe levels of cobalt in one well (well MW-O4), averaging 7.9 µg/L and ranging as high as 16 µg/L. These wells are unlikely to show detection monitoring SSIs, and Midwest Generation has not initiated assessment monitoring at the site.

EIP's Ashtracker database includes more wells (eleven) surrounding all three onsite ash ponds, and covers the 2010-2015 time period ([see Attachment D](#)). The additional data show unsafe levels of cobalt in wells MW-8 and MW-9, located near Ash Pond 3. Well MW-9 also has unsafe levels of manganese and sulfate.

There are no groundwater wells near the old, onsite coal ash landfills at Joliet 29, but these units may also be contaminating the groundwater or Des Plaines River. These unregulated old landfills underscore the need for Illinois to take action to investigate the scope and severity of contamination from old coal ash dumps and ensure those old dumps are cleaned up.



REGION 2: ILLINOIS RIVER

Illinois' namesake river is a destination for recreational paddlers and home to abundant wildlife, in addition to being a major conduit for barge traffic. The Illinois River system hosts a relatively high diversity of aquatic species, with approximately 35 mussel species and 115 fish species found in and around its waters. Many of these species require both riverine and floodplain habitat as part of their life cycle. The floodplain is home to many wildlife refuges, which provide a much needed sliver of habitat in a transformed landscape.

The Illinois River has more Illinois power plants on its banks and in its floodplain than any other river in the state. Along the river is Hennepin Power Station, Edwards Plant, Powerton, Duck Creek, Havana, and the closed Meredosia Station and Pearl Station. One of these wildlife areas, the Donnelley Wildlife Area, is directly adjacent to the coal ash at the Hennepin Power Station, and many other wildlife areas are not too far upstream or downstream from coal ash ponds.

6 DUCK CREEK

Vistra subsidiary Dynegy²³ owns and operates the Duck Creek Power Station, located about 25 miles southwest of Peoria and adjacent to the Rice Lake Fish and Wildlife Area. Duck Creek has four ash ponds and an ash landfill. The ash pond located closest to the power plant is a small Bottom Ash Basin. Just north of the plant are two larger, inactive fly ash ponds, Ash Pond 1 and Ash Pond 2. Dynegy has not yet posted any groundwater monitoring data for these ponds. A fourth ash pond, known as the Gypsum Management Facility (GMF) pond, is located



DUCK CREEK LANDFILL AND GMF POND

TABLE 6.1: THE GROUNDWATER AT DUCK CREEK IS UNSAFE FOR DRINKING

Well	Pollutant	Health threshold	Illinois Class I Groundwater Quality Standard	Mean concentration	Maximum concentration
BA06*	Boron (mg/L)	3	2	3.0	3.9
	Cobalt (µg/L)	6	1000	17.3	37.0
G06S	Arsenic (µg/L)	10	10	18.8	74.0
	Cobalt (µg/L)	6	1000	35.5	130.0
	Lead (µg/L)	15	7.5	83.5	340.0
	Lithium (µg/L)	40		85.0	410.0
G09S	Cobalt (µg/L)	6	1000	11.3	42.0
	Lead (µg/L)	15	7.5	27.4	100.0

* UPGRADIENT WELL

about one mile north of the other two ponds and has a distinct network of monitoring wells. The Duck Creek coal ash landfill is even further north and it also has a distinct groundwater monitoring network.

The ash ponds at Duck Creek Power Station collectively store over 10 million cubic yards of coal ash. The ponds sit adjacent to the Duck Creek Cooling Water Lake, which drains into the Illinois River.

The groundwater around these disposal areas has unsafe

levels of multiple pollutants. Wells downgradient from the coal ash landfill have unsafe levels of arsenic, cobalt, lead, and lithium, in some cases more than twenty times higher than safe levels. One well that Dynegy has identified as

TABLE 6.2: WELLS WITH LIKELY ASSESSMENT MONITORING SSIs AT DUCK CREEK

Downgradient well	Pollutants exceeding likely groundwater standard
GMF POND	
G57S	Antimony
LANDFILL	
G06S	Antimony, Arsenic, Beryllium, Cadmium, Chromium, Cobalt, Lead, Lithium, Radium, Thallium
G09S	Arsenic, Beryllium, Cadmium, Chromium, Cobalt, Lead, Radium
G12S	Antimony, Beryllium, Cadmium, Cobalt, Thallium
G15S	Cobalt



DUCK CREEK BOTTOM ASH POND DETAIL MAP



DUCK CREEK COAL ASH PONDS

upgradient of the bottom ash basin,²⁴ well BA06, has unsafe levels of both boron and cobalt. The high boron concentration—nearly twice Illinois’ standard—together with relatively high concentrations of sulfate and total dissolved solids, suggest that groundwater at the well has been polluted by coal ash.²⁵

6.1 Compliance

Dynegy has not posted notices of assessment monitoring for any of the Duck Creek coal ash units. The available data suggest that Dynegy should have found detection monitoring SSIs for calcium and total dissolved solids at the GMF pond, and for calcium and chloride at the landfill. Once in assessment monitoring, Dynegy will likely find SSIs for multiple pollutants, particularly at the landfill, and will have to take corrective action.

6.2 The Closure Plan for Duck Creek Is Unlikely to Stop Contamination

With the exception of the Bottom Ash Basin, Dynegy intends to close in place all the coal ash ponds at the

Duck Creek Power Station. The coal ash in the Bottom Ash Basin, which is much smaller than the other ponds, will be excavated and placed in other ponds at the site. Dynegy has already submitted closure plans for Ash Pond 1 and Ash Pond 2 to the Illinois EPA and is awaiting approval. Capping ash ponds does not stop groundwater from flowing through those ponds, picking up toxic contaminants in the process. Duck Creek’s ash ponds put the Illinois River, as well as the aquatic ecosystem of the Rice Lake State Fish and Wildlife Area and those who fish and hunt there, at risk.

7 EDWARDS

Dynegy monitors groundwater around a single unlined ash pond at the Edwards Power Station in Bartonville, just downstream from Peoria and immediately upstream of Pekin. The coal ash pond was built in the floodplain of the Illinois River and the ash in the pond is up to 71 feet thick, at least 10 feet of which is saturated with groundwater.²⁶

TABLE 7.1: THE GROUNDWATER AT EDWARDS IS UNSAFE FOR DRINKING

Well	Pollutant	Health threshold	Illinois Class I Groundwater Quality Standard	Mean concentration	Maximum concentration
AW-05	Arsenic (µg/L)	10	10	12.7	29.0
	Cobalt (µg/L)	6	1000	16.5	54.0
	Lithium (µg/L)	40		48.8	120.0
AW-06	Cobalt (µg/L)	6	1000	6.6	19.0
AW-09	Arsenic (µg/L)	10	10	18.2	46.0
	Cobalt (µg/L)	6	1000	28.4	93.0
	Lead (µg/L)	15	7.5	27.4	110.0
	Lithium (µg/L)	40		80.8	260.0
AW-10	Arsenic (µg/L)	10	10	23.2	97.0
	Cobalt (µg/L)	6	1000	42.0	250.0
	Lead (µg/L)	15	7.5	42.8	270.0
	Lithium (µg/L)	40		174.8	850.0
AW-11	Arsenic (µg/L)	10	10	12.5	25.0
	Cobalt (µg/L)	6	1000	20.1	46.0
	Lead (µg/L)	15	7.5	20.9	50.0
	Lithium (µg/L)	40		75.3	140.0

TABLE 7.2: WELLS WITH LIKELY ASSESSMENT MONITORING SSIs AT EDWARDS

Downgradient well	Pollutants exceeding likely groundwater standard
AW-05	Arsenic, Cobalt, Lead, Lithium
AW-06	Arsenic, Cobalt, Lead, Lithium
AW-09	Arsenic, Chromium, Cobalt, Lead, Lithium, Radium
AW-10	Arsenic, Barium, Chromium, Cobalt, Lead, Lithium, Radium, Thallium
AW-11	Arsenic, Barium, Cobalt, Lead, Lithium, Radium



EDWARDS ASH POND

The groundwater at Edwards is unsafe. All of the downgradient monitoring wells at the Edwards ash pond have unsafe levels of arsenic, cobalt, lead, and/or lithium. These wells also show clear evidence that coal ash is the source of the contamination, with elevated levels of boron, sulfate, and other detection monitoring pollutants. Arsenic is present in groundwater at concentrations approaching ten times the safe level; lead is present at concentrations eighteen times EPA's health threshold and thirty-six times Illinois' standard; lithium concentrations exceed twenty times the safe level; and cobalt concentrations exceed 40 times the safe level.

7.1 Compliance

Dynegy has initiated assessment monitoring at Edwards, and is likely to find many SSIs for multiple pollutants:

7.2 The Closure Plan at Edwards is Unlikely to Stop Contamination

Despite clear evidence of contamination, Dynegy is planning to close this ash pond by leaving the ash in place.²⁷ Since the ash is in constant contact with groundwater, contamination will continue indefinitely after closure, endangering users of that groundwater and the Illinois River in this highly populated area.



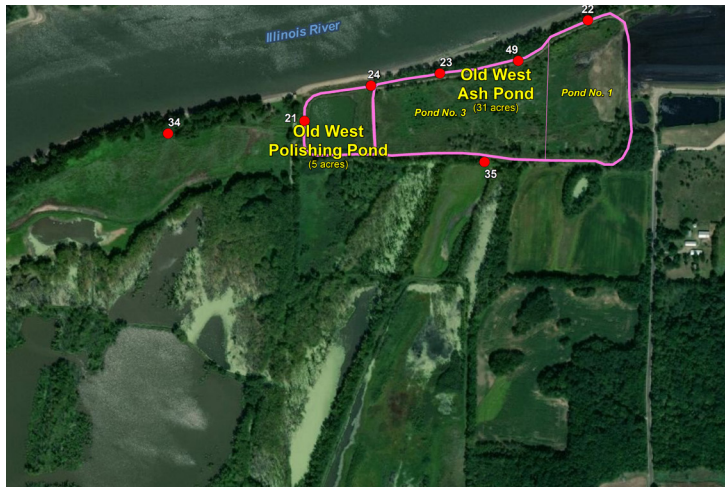
HAVANA COAL ASH POND

8 HAVANA

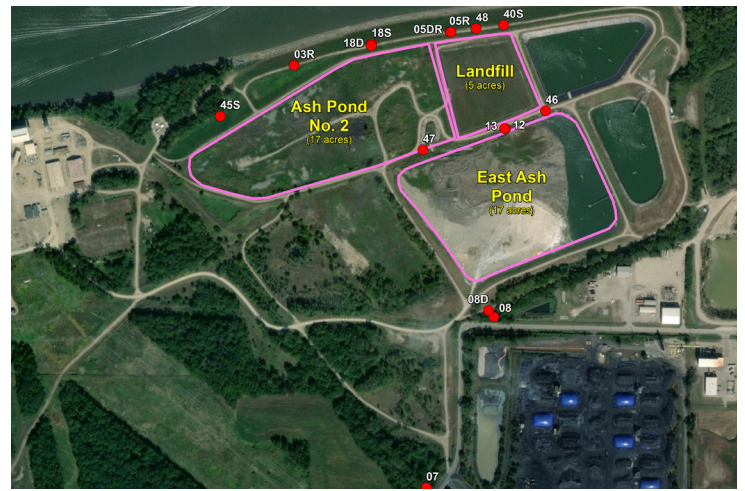
Dynegy's Havana Power Station in Havana, located on the Illinois River just downstream from the Emiquon Preserve and National Wildlife Refuge, has one regulated, unlined coal ash pond known as the "East Ash Pond." Dynegy is planning to close the pond by leaving the ash in place. The groundwater at Havana does not currently show evidence of being unsafe, as the average concentrations of all measured pollutants are below their respective health-based thresholds. The groundwater does show signs of coal ash impacts, however, with elevated concentrations of boron and/or sulfate in multiple wells, and Dynegy has initiated assessment monitoring at the site. Once in assessment monitoring, Dynegy may find SSIs for cobalt in well HAMW-40 (where cobalt has been measured at up to 11 µg/L, a concentration that exceeds safe levels).

9 HENNEPIN

Dynegy owns and operates the Hennepin Power Station in Hennepin, Illinois, which abuts the Illinois River about 15 miles downstream from Starved Rock State Park. Dynegy is currently monitoring several coal ash dumps at Hennepin pursuant to the coal ash rule, including "Ash Pond 2," the "East Ash Pond," the "Old West Ash Pond and Old West Polishing Pond," and a landfill immediately east of Ash Pond 2. The company has only posted a liner assessment for the East Ash Pond (which is unlined), but the Illinois EPA's record shows that the western ash



HENNEPIN WEST COAL ASH PONDS



HENNEPIN EAST COAL ASH PONDS

TABLE 9.1: THE GROUNDWATER AT HENNEPIN IS UNSAFE FOR DRINKING

Well	Pollutant	Health threshold	Illinois Class I Groundwater Quality Standard	Mean concentration	Maximum concentration
03R	Molybdenum (µg/L)	100		215	266
05R	Lithium (µg/L)	40		55.9	64.8
8*	Cobalt (µg/L)	6		12.0	28.5
08D*	Cobalt (µg/L)	6		13.7	38.5
18S	Boron (mg/L)	3	2	5.3	10.8
	Lithium (µg/L)	40		86.8	130.0
	Molybdenum (µg/L)	100		339	414
	Selenium (µg/L)	50	50	62	117
21	Boron (mg/L)	3	2	4.2	4.6
22	Boron (mg/L)	3	2	5.8	6.7
	Lithium (µg/L)	40		57.4	64.1
	Molybdenum (µg/L)	100		176	206
23	Boron (mg/L)	3	2	7.5	8.5
24	Arsenic (µg/L)	10	10	30.3	34.3
35	Boron (mg/L)	3	2	7.1	11.1
40S	Lithium (µg/L)	40		63.8	71.9
	Molybdenum (µg/L)	100		104	129
48	Lithium (µg/L)	40		43.6	48.9
	Molybdenum (µg/L)	100		108	130

TABLE 9.2: WELLS WITH LIKELY ASSESSMENT MONITORING SSIs AT HENNEPIN

Downgradient well	Pollutants exceeding likely groundwater standard
ASH POND 2	
03R	Molybdenum
18S	Lithium, Molybdenum, Selenium
WEST ASH POND	
22	Lithium, Molybdenum
LANDFILL	
48	Lithium, Molybdenum
05R	Lithium
40S	Lithium, Molybdenum

ponds are also unlined.²⁸ The west ash ponds sit in the floodplain of the Illinois River. Maps from FEMA show the ash partially underwater in the 100-year flood, and fully inundated in the 500-year flood.

The groundwater at Hennepin is unsafe. Dynegy's monitoring has revealed arsenic and boron in concentrations more than three times safe levels; lithium at concentrations nearly twelve times the safe level, and unsafe levels of cobalt, molybdenum and selenium.

9.1 Compliance

Dynegy has initiated assessment monitoring at all three ash ponds. Once in assessment monitoring, Dynegy is likely to find SSIs for lithium, molybdenum and selenium at Ash Pond 2, and for lithium and molybdenum at the West Ash Pond. The Hennepin landfill should also be in assessment monitoring, as the wells downgradient of the landfill show elevated concentrations of boron, fluoride, and pH. Dynegy has not initiated assessment monitoring at the landfill (or at least it has not posted a notice of assessment monitoring). If and when it does initiate assessment monitoring, it is likely to find SSIs for lithium and molybdenum, which would trigger corrective action.

9.2 The Closure Plans at Hennepin Are Unlikely to Stop Contamination

Dynegy is planning to close everything but the Old West Polishing Pond at Hennepin by leaving the ash in place. Capping in place allows the widespread groundwater contamination to continue indefinitely and maintains

the threat that the ash will be inundated in ever-more-frequent flooding.

10 MEREDOSIA

The former Meredosia Generation Station in Meredosia, Illinois, just over 40 miles west of Springfield as the crow flies, has ash ponds that were excluded from regulation under the coal ash rule. There are three unlined coal ash ponds on site. The Fly Ash Pond and Bottom Ash Pond were both in operation until the power station closed in 2011. There is also an "Old Ash Pond" on site,²⁹ about which there is little publicly available information.

Groundwater monitoring between 2010 and 2016 shows elevated levels of arsenic and boron in multiple wells, both up to twenty times the health based thresholds. Modeling shows that the groundwater flows into the Illinois River, discharging 15,000 lbs of boron and 112 lbs of arsenic into the river annually.³⁰

10.1 The Closure Plan at Meredosia is Unlikely to Stop Contamination

Ameren, the owner of the power station, submitted a closure plan to the Illinois EPA in 2016. Their plan, which was approved, was to close their coal ash ponds by excavating the Bottom Ash Pond into Fly Ash Pond, and capping that in place. Ameren began closure of the ponds in February 2018. Closure in place does not stop groundwater from flowing through unlined ash ponds, picking up toxic contamination in the process, and the location of those ash ponds in the floodplain of the Illinois River makes leaving toxic ash there all the more precarious. Illinois must take action to ensure that toxic ash from Meredosia's two unlined impoundment does not threaten Illinois' namesake river.

The former Pearl Generation Station in Pearl, Illinois, just over 50 miles southwest of Springfield as the crow flies, is not subject to the Coal Ash Rule. However, a notice of groundwater violation issued by the Illinois EPA in 2012 shows contaminated groundwater. Specifically, data from 2010 show consistently unsafe levels of boron, manganese and sulfate in several onsite wells. Illinois EPA reported in 2017 that the unlined coal ash impoundment at Pearl was "closed with [a] cover[]" before October 2015, but closure by capping does not prevent continued groundwater flow through ash left in unlined impoundments. Groundwater data for Pearl post-closure by cap was not available to the authors of this report at the time of publication.

TABLE 10.1: THE GROUNDWATER AT MEREDOSIA IS UNSAFE FOR DRINKING

Well	Pollutant	Health threshold	Illinois Class I Groundwater Quality Standard	Mean concentration	Maximum concentration
APW-2	Boron (mg/L)	3	2	3.0	3.9
	Manganese (mg/L)	0.3	0.15	0.82	0.99
APW-3	Arsenic (µg/L)	10	10	196	310
	Boron (mg/L)	3	2	30	46
	Manganese (mg/L)	0.3	0.15	0.46	1.2
APW-4	Arsenic (µg/L)	10	10	60	180
	Boron (mg/L)	3	2	3.6	6.3
	Manganese (mg/L)	0.3	0.15	3.0	5.4

11 PEARL

The former Pearl Generation Station in Pearl, Illinois, just over 50 miles southwest of Springfield as the crow flies, is not subject to the Coal Ash Rule. However, a notice of groundwater violation issued by the Illinois EPA in 2012³¹ shows contaminated groundwater. Specifically, data from 2010 show consistently unsafe levels of boron, manganese and sulfate in several onsite wells. Illinois EPA reported in 2017 that the unlined coal ash impoundment at Pearl was “closed with [a] cover” before October 2015,³² but closure by capping does not prevent continued groundwater flow through ash left in unlined impoundments. Groundwater data for Pearl post-closure by cap was not available to the authors of this report at the time of publication.

12 POWERTON

Midwest Generation operates the Powerton Generating Station in Pekin. The site has several active and inactive ash ponds, all of which are unlined. For purposes of the coal ash rule, Midwest Generation reports the results of a multi-unit groundwater monitoring network surrounding three of these ash ponds. Coal ash is not limited to the ash ponds at Powerton, however; coal ash has been dumped as “fill” all across the site, up to 24 feet deep, and often below the water table.³³

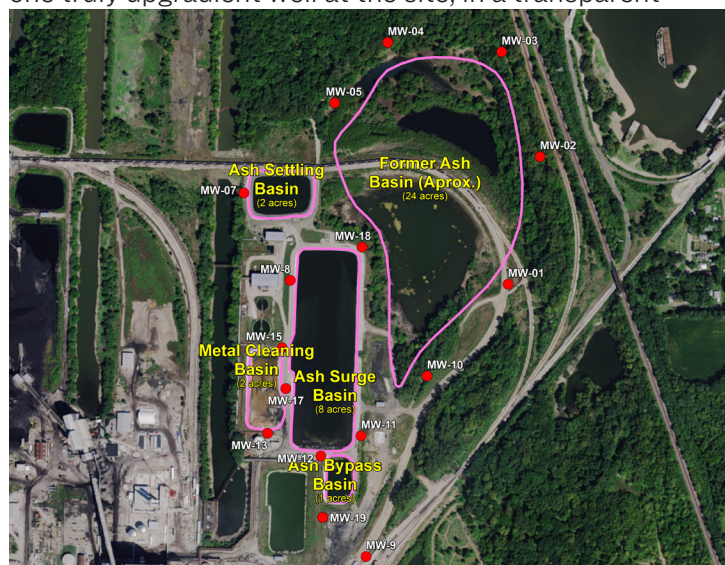
Due to some combination of the coal ash ponds and the extensive coal ash fill at the site, the groundwater at Powerton is unsafe. Midwest Generation’s monitoring revealed arsenic at concentrations up to fifty times safe levels in addition to unsafe levels of boron, cobalt and sulfate.

Additional data are available on EIP’s ashtracker website, covering sixteen wells over the 2010–2017 time period. Several of the contaminated wells from the ashtracker database are not included in Midwest Generation’s Coal Ash Rule reporting, including wells MW-6, 7, 13, and 14. The ashtracker data show unsafe levels of arsenic, boron, cobalt, manganese, sulfate, and thallium.

[See Attachment D.](#)

12.1 Compliance

There is no doubt that the exceedingly high concentrations of dangerous pollution at Powerton are a result of coal ash. However, in a clear attempt to avoid cleaning up its act and stopping further pollution, Midwest Generation has manipulated the groundwater monitoring at the site. The company inaccurately described four wells as “upgradient,” and ignored the one truly upgradient well at the site, in a transparent



POWERTON ASH PONDS

TABLE 12.1: THE GROUNDWATER AT POWERTON IS UNSAFE FOR DRINKING

Well	Pollutant	Health threshold	Illinois Class I Groundwater Quality Standard	Mean concentration	Maximum concentration
MW-09*	Boron (mg/L)	3	2	3.2	4.5
MW-10*	Cobalt (µg/L)	6	1000	6.3	8.0
MW-11	Arsenic (µg/L)	10	10	68.6	290.0
MW-12	Arsenic (µg/L)	10	10	173.7	500.0
	Sulfate (mg/L)	500	400	529	650
MW-15	Arsenic (µg/L)	10	10	27.7	130.0
	Sulfate (mg/L)	500	400	740	1,400
MW-17	Arsenic (µg/L)	10	10	228.4	410.0
	Sulfate (mg/L)	500	400	748	960
MW-19*	Boron (mg/L)	3	2	3.7	4.7

* UPGRADIENT WELLS

effort to obscure the widespread onsite contamination. In 2012, Illinois EPA told Midwest Generation that wells MW-1, MW-9 and MW-10 could not be used as upgradient wells because they are “within an area of impacted groundwater from historical ash-related handling activities.”³⁴ Midwest Generation then installed a new upgradient well, MW-16.³⁵ Yet, for the groundwater monitoring the company is performing under the coal ash rule, Midwest Generation is ignoring well MW-16 and relying on the three previously rejected, contaminated wells as “upgradient” (along with a new well, MW-19, that also shows clear evidence of coal ash contamination).

Since Midwest Generation is using contaminated wells as upgradient wells, statistical comparisons are less likely to result in findings that coal ash pollution in downgradient wells is “significantly” more than the contamination in upgradient wells, triggering closure. Although Midwest Generation has posted a notice of assessment monitoring stating that its analysis “yielded” SSIs for “several

Appendix III constituents across multiple downgradient well locations,”³⁶ those SSIs are almost certainly fewer than would have been found if Midwest Generation had properly identified uncontaminated upgradient wells. By manipulating their groundwater monitoring, Midwest Generation is attempting to thwart taking responsibility to stop contaminating and clean up Illinois’ waters.

When Dynegy begins assessment monitoring at Powerton, it is likely to find SSIs for several dangerous pollutants, including arsenic, cadmium, lithium, molybdenum, radium, and thallium.

12.2 The Closure Plans at Powerton Are Unlikely to Stop Contamination

Midwest Generation plans to close the Ash Surge Basin and the Bypass basin by removal. It also plans to close the northern portion of a no-longer-used ash pond, the Former Ash Basin, by removal—but that ash simply will be moved to the southern portion of the Former Ash Basin, which the company plans to close in place. Removal of the ash from the Ash Basin, Bypass Basin, and northern portion of the Former Ash Basin is an important step towards limiting pollution at the site, but is far from sufficient. Unless the coal ash is removed from the large southern portion of the Former Ash Basin and from where it was dumped as “fill” all across the site, the groundwater at Powerton—and thus the Illinois River, into which some of that groundwater flows—will continue to be fouled by coal ash pollution for centuries.

TABLE 12.2: WELLS WITH LIKELY ASSESSMENT MONITORING SSIs AT POWERTON

Downgradient well	Pollutants exceeding likely groundwater standard
MW-11	Arsenic
MW-12	Arsenic, Cadmium
MW-15	Arsenic, Lithium
MW-17	Arsenic, Molybdenum, Radium, Thallium



REGION 3: CENTRAL ILLINOIS

Central Illinois is home to many man-made lakes, including Lake Springfield, Sangchris Lake, Coffeen Lake, and Newton Lake, among others. These impounded waters and their adjacent land provide recreational opportunities, drawing in boaters, fishers, hunters, campers and folks who enjoy spending time near water. Some also provide drinking water to nearby communities. The waters are also home to a vast array of wildlife.

However, all of these lakes are also home to power plants, built on the edge of the lake for access to cooling water. In some cases, the lake itself was built to provide cooling water for the plant. The coal ash produced at the plants is stored in ash ponds next to the lakes. Coffeen Power Station on Coffeen Lake, Dallman Station on Lake Springfield, Kincaid Generating Station on Sangchris Lake, and Newton Power Station on Newton Lake collectively store over thirty million cubic yards of ash on the banks of their lakes.

The Central Illinois region is also home to Illinois's only National Scenic River, the Middle Fork of the Vermilion River. The Middle Fork is home to 24 State threatened or endangered species and draws multitudes of river enthusiasts who come to enjoy its scenic, meandering flow. The outfitter Kickapoo Adventures puts over 10,000 people on the river in canoes, kayaks and tubes each year. The Vermilion River flows into the Wabash River, which forms a significant portion of the divide between Illinois and Indiana.

These rivers are home to the Vermilion Power Station and Hutsonville Station. The coal ash pits at the Vermilion Power Station sit on the banks of the Middle Fork,

continuously seeping contamination into the river. The Hutsonville Station is closed, but the coal ash continues to impact groundwater that flows towards the Wabash River.

13 COFFEEN

The Coffeen Power Station in Coffeen, Illinois, just over 45 miles south of Springfield, has five regulated coal ash dumps including four ash ponds (Ash Pond 1, Ash Pond 2, the "GMF Pond," and the "GMF Recycle Pond"), and a 21-acre ash landfill. Collectively, these dumps store five million cubic yards of coal ash, the size of roughly 1,500 Olympic sized swimming pools. Although Ash Pond 2 ceased to be used and a clay cap was placed over it in

TABLE 13.1: THE GROUNDWATER AT COFFEEN IS UNSAFE FOR DRINKING

Well	Pollutant	Health threshold	Illinois Class I Groundwater Quality Standard	Mean concentration	Maximum concentration
G215	Arsenic (µg/L)	10	10	29.2	110.0
G279	Sulfate (mg/L)	500	400	591	870
G301	Sulfate (mg/L)	500	400	730	800
G303	Lithium (µg/L)	40		54.3	76.0
	Sulfate (mg/L)	500	400	784	870
G304	Cobalt (µg/L)	6	1000	7.3	14.0
	Sulfate (mg/L)	500	400	1,033	1,100
G307	Cobalt (µg/L)	6	1000	10.0	34.0
	Lead (µg/L)	15	7.5	15.1	68.0
	Sulfate (mg/L)	500	400	1,046	1,300
G401	Arsenic (µg/L)	10	10	20.2	68.0
	Boron (mg/L)	3	2	3.7	4.4
	Cadmium (µg/L)	5	5	5.4	19.0
	Cobalt (µg/L)	6	1000	280.0	360.0
	Lead (µg/L)	15	7.5	30.2	98.0
	Lithium (µg/L)	40		79.4	160.0
	Sulfate (mg/L)	500	400	2,500	3,900
G402	Arsenic (µg/L)	10	10	13.9	27.0
	Boron (mg/L)	3	2	6.4	7.4
	Cobalt (µg/L)	6	1000	11.4	19.0
	Lithium (µg/L)	40		42.3	57.0
	Sulfate (mg/L)	500	400	1,023	1,200
G404	Boron (mg/L)	3	2	3.0	5.8
G405	Boron (mg/L)	3	2	13.3	17.0
	Sulfate (mg/L)	500	400	1,453	1,800

the mid-1980s,³⁷ it still contains coal ash to a depth of roughly 28 feet and a report from Dynegey indicates that seeps from Ash Pond 2 discharge 11,000 pounds of boron into Coffeen Lake or its tributary each year.³⁸

The groundwater at Coffeen is unsafe. Dynegey's groundwater monitoring revealed multiple coal ash pollutants at dangerous concentrations. These include

cobalt at up to sixty times the safe level, arsenic at up to eleven times safe levels, and unsafe levels of boron, cadmium, lead, lithium, and sulfate. Dangerous pollution is not new to Coffeen: in 2012, Illinois EPA issued then-owner Ameren a violation notice for groundwater contamination above limits for coal ash pollutants boron, manganese, sulfate and total dissolved solids. Additional groundwater monitoring data from 2010-2012 show

TABLE 13.2: WELLS WITH LIKELY ASSESSMENT MONITORING SSIs

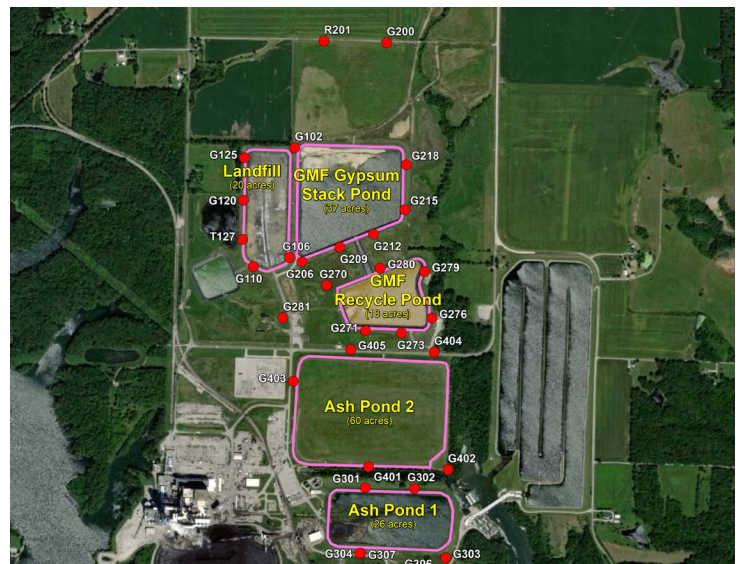
Downgradient well	Pollutants exceeding likely groundwater standard
ASH POND 1	
G303	Arsenic, Lithium
G304	Cobalt
G307	Arsenic, Chromium, Cobalt, Lead, Lithium
ASH POND 2	
G401	Arsenic, Cadmium, Chromium, Cobalt, Lead, Lithium
G402	Arsenic, Cobalt, Lead, Lithium
G405	Arsenic
GMF GYPSUM STACK POND	
G215	Arsenic

unsafe levels of boron, cobalt, manganese and/or sulfate in separate monitoring wells ([see Attachment D](#)).

13.1 Compliance

Dynegy has initiated assessment monitoring at Ash Ponds 1 and 2 and the GMF Recycle Pond. Assessment monitoring is likely to find SSIs for multiple pollutants, as shown in Table 13.2. These SSIs would trigger corrective action, but it is important to note that the only kind of corrective action that would lead to cleaner groundwater is removal of coal ash. Leaving 28 feet of ash in Ash Pond 2, for example, will do nothing to fix the problem.

13.2 The Closure Plans at Coffeen Are Unlikely to Stop Contamination



COFFEEN ASH PONDS AND LANDFILL

Despite the torrent of ongoing coal ash contamination at Coffeen, Dynegy is planning to close all its ash dumps except for the GMF Recycle Pond by leaving the ash in place. Unless Illinois takes action to ensure coal ash is fully removed, the waters near Coffeen will continue to be contaminated indefinitely. Leaving 28 feet of ash in Ash Pond 2, for example, will do nothing to fix the problem.

14 DALLMAN/LAKESIDE

City Water, Light and Power (CWLP) owns and operates an ash dump used for coal ash generated at the Lakeside (retired) and Dallman Power Generating Stations in Springfield. The site includes two unlined ash ponds and a flue gas desulfurization waste³⁹ landfill.

The coal ash sits along Spaulding Dam, on the opposite side of the dam from Lake Springfield, the drinking water source for the city. Sugar Creek, which receives the dam releases from Lake Springfield, flows northward around the coal ash towards the Sangamon River. The coal ash

TABLE 14.1: THE GROUNDWATER AT DALLMAN/LAKESIDE IS UNSAFE FOR DRINKING

Well	Pollutant	Health threshold	Illinois Class I Groundwater Quality Standard	Mean concentration	Maximum concentration
AP-1	Boron (mg/L)	3	2	18.1	22.5
	Sulfate (mg/L)	500	400	569	664
AP-2	Boron (mg/L)	3	2	4.3	5.0
	Sulfate (mg/L)	500	400	454	711
AP-3	Boron (mg/L)	3	2	17.7	20.1
AW-3	Arsenic µg/L)	10	10	165	231



DALLMAN COAL ASH PONDS AND LANDFILL

ponds—all unlined⁴⁰—and landfill contain over two million cubic yards of coal ash and the whole system is entirely within the floodplain of the Lake and Sugar Creek and would be underwater in the 100-year flood.

There is a serious contamination problem at the site. Boron—a key coal ash indicator pollutant—was found at unsafe levels in three of the four downgradient monitoring wells at the site. The concentrations in two wells are more than six times higher than the 3 mg/L child health advisory for boron, ten times higher the 2 mg/L groundwater standard in Illinois, and roughly 200 times higher than the boron concentrations in the

onsite upgradient wells. Concentrations of sulfate, also a major indicator pollutant for coal ash, exceed the health threshold in two wells and are almost double Illinois’ standard in one of those wells.

Arsenic concentrations in well AW-3 are twenty times higher than the safe level. For other wells at the site, it’s impossible to tell if the arsenic concentrations are above the safe level because the test that CWLP used cannot detect arsenic at levels less than 25 µg/L, which is more than double the health-based threshold of 10 µg/L. It is possible that every single sample taken at CWLP contains arsenic above the safe level, but CWLP’s defective monitoring keeps Illinoisans in the dark.

14.1 Compliance

The CWLP ash disposal area is in assessment monitoring. It is possible that CWLP will find SSIs that should then trigger pond corrective action at the site. Because the ash ponds are all unlined, they will need to be closed promptly under a recent order from the D.C. Circuit Court of Appeals.

14.2 The Closure Plans at Dallman/Lakeside Are Unlikely to Stop Contamination

CWLP plans to close its ash ponds in place. Capping the nearly two million tons of ash at the site will allow contamination of groundwater and Sugar Creek, and potentially Lake Springfield to continue indefinitely.

TABLE 15.1: GROUNDWATER AT HUTSONVILLE IS UNSAFE FOR DRINKING

Well	Pollutant	Health threshold	Illinois Class I Groundwater Quality Standard	Mean concentration	Maximum concentration
MW8	Boron (mg/L)	3	2	15.8	18.2
	Manganese (mg/L)	0.3	0.15	2.5	3.4
MW11R	Boron (mg/L)	3	2	2.1	5.3
	Manganese (mg/L)	0.3	0.15	0.23	0.88
MW7D	Manganese (mg/L)	0.3	0.15	0.63	1.0
MW14	Manganese (mg/L)	0.3	0.15	0.87	1.6
MW115S	Manganese (mg/L)	0.3	0.15	0.81	0.89
MW115D	Manganese (mg/L)	0.3	0.15	0.27	0.50
MW121	Manganese (mg/L)	0.3	0.15	0.76	0.94
MW23D*	Manganese (mg/L)	0.3	0.15	-	0.211
MW23S*	Manganese (mg/L)	0.3	0.15	-	0.2



HUTSONVILLE COAL ASH PONDS

15 HUTSONVILLE

Ameren's former Hutsonville Power Station, located on the Wabash River immediately across the state border from Indiana, closed in 2011 and was excluded from regulation under the federal coal ash rule. There were once five coal ash ponds at the site. Ash in three of the ponds which have been excavated into the other two ponds, which were both capped and left in place.

Per the Illinois EPA-approved closure plan, Ameren monitors the groundwater quality below the capped coal ash ponds. They also operate a series of pumps to keep contaminated groundwater from leaving the southern boundary of their property. They pump the contaminated groundwater up to the surface and into a trench which dumps into the Wabash River.

Thus far, the cap has not stopped the contamination of groundwater at the site, which flows towards the Wabash River. Boron concentrations in monitoring well MW8 between the river and the ash are almost eight times the Illinois groundwater standard and manganese is sixteen times the standard. Boron concentrations near the groundwater pumps on the southern boundary remain above the groundwater standard as well.

Ameren is also required to monitor their surface water discharge, which include the contaminated groundwater that they pump into the trench and into the Wabash. Iron in the groundwater trench has exceeded surface water quality standards on multiple occasions.

16 KINCAID

Dynegy's Kincaid Power Station, located just over 10 miles southeast of Springfield, has one large (75-acre)



KINCAID COAL ASH POND

ash pond on the shore of Sangchris Lake, a popular fishing destination that the Illinois Department of Natural Resources describes as “an angler’s paradise.”⁴¹ The ash pond was built in the mid-1960s and is unlined.

Groundwater monitoring data suggest that the pond is leaking, with elevated levels of detection monitoring constituents like boron and sulfate, and Dynegy has initiated assessment monitoring. A downgradient monitoring well shows levels of boron over the federal health standard and nearly double Illinois’ groundwater standard of 2 mg/L. Most monitoring results, however, show pollution at safe levels, and the data do not suggest that Dynegy is likely to find SSIs during assessment monitoring.

17 NEWTON

Dynegy's Newton Power Plant includes two ash ponds—only one of which, the “Primary Ash Pond,” Dynegy



ASH POND AND LANDFILL

TABLE 17.1: THE GROUNDWATER AT NEWTON IS UNSAFE FOR DRINKING

Well	Pollutant	Health threshold	Illinois Class I Groundwater Quality Standard	Mean concentration	Maximum concentration
G201*	Arsenic (µg/L)	10	10	32.3	39.0
G48MG*	Arsenic (µg/L)	10	10	65.6	100.0
APW5*	Arsenic (µg/L)	10	10	16.0	21.0
G203	Arsenic (µg/L)	10	10	14.0	16.0
G208	Arsenic (µg/L)	10	10	60.1	69.0
G217D	Arsenic (µg/L)	10	10	52.8	73.0
	Cobalt (µg/L)	6	1000	7.7	36.0
G220	Arsenic (µg/L)	10	10	68.3	82.0
G222	Arsenic (µg/L)	10	10	60.6	130.0
G223	Arsenic (µg/L)	10	10	47.8	62.0
APW8	Arsenic (µg/L)	10	10	14.5	20.0
APW9	Arsenic (µg/L)	10	10	11.3	18.0

*UPGRADIENT WELLS

acknowledges as regulated by the coal ash rule—and one ash landfill (“Landfill 2”), which is physically two split into two landfills.⁴² The ash pond, located between the power plant and Newton Lake in east-central Illinois, is roughly 170 acres in size, unlined, and contains up to 49 feet of ash. Newton presently has more coal ash than any other site in Illinois with 22 million cubic yards of coal ash. Landfill 2 is located immediately west of the Primary Ash Pond.

The groundwater near the Newton coal ash dumps appears to contain coal ash contamination, with elevated concentrations of multiple coal ash pollutants in downgradient wells. The groundwater is also unsafe, with high arsenic levels across the site. However, upgradient and downgradient wells show roughly the same arsenic levels, which suggests that the arsenic could be naturally occurring. The only other pollutant present at unsafe levels is cobalt in one well immediately north of both the ash pond and the landfill.

17.1 Compliance

Despite the fact that Dynegy almost certainly found detection monitoring SSIs, it has not initiated assessment monitoring at Newton. If and when Dynegy does conduct assessment monitoring, it may find SSIs that could result in pond closure and/or corrective action. Well G217D, for

example, had mean concentrations of cobalt, lead and lithium that exceeded all upgradient results.

17.2 The Closure Plans at Newton are Unlikely to Stop Contamination

Dynegy plans to close the unlined, vast Primary Ash Pond in place. Leaving all that coal ash adjacent to popular fishing destination Newton Lake will do nothing to protect the groundwater or the lake from continuing coal pollution. Rather, it will allow the ash to continue to leach dangerous contaminants into those waters indefinitely.



VERMILION COAL ASH PONDS

18. VERMILION

The Vermilion Power Station closed in 2011 and it was not initially regulated by the Coal Ash Rule.⁴³ The site is, however, continuously releasing contaminants into the Middle Fork of the Vermilion River, Illinois's only National Scenic River. Dynegy and former owners of the power plant dumped over three million cubic yards of coal ash into three large coal ash ponds on the banks of the river. All three coal ash ponds are unlined.

Limited groundwater testing results at Vermilion indicate that the groundwater at the site is unsafe. Illinois EPA required groundwater testing at the site in 2011 and again between 2017 and 2018. These two snapshots of

groundwater data show continuous contamination of the groundwater below the coal ash. In 2011, for example, testing revealed boron at concentrations more than thirteen times the health threshold and twenty times the Illinois groundwater standard, as well as sulfate at concentrations up to three times the health threshold and nearly four times Illinois' groundwater standard. More recent sample results reveal even higher boron concentrations, up to twenty six times the Illinois' groundwater standard, as well as ongoing concentrations of arsenic and sulfate above the safe level.

Groundwater testing at Vermilion also revealed elevated manganese, another coal ash pollutant, at levels over

TABLE 18.1: THE GROUNDWATER AT VERMILION IS UNSAFE FOR DRINKING

Well	Pollutant	Health threshold	Illinois Class I Groundwater Quality Standard	Maximum concentration (2011)	Maximum concentration (2018)
MW-04	Boron (mg/L)	3	2	7.8	6.7
	Manganese (mg/L)	0.3	0.15	1.0	0.75
MW-05	Boron (mg/L)	3	2	22	18
	Manganese (mg/L)	0.3	0.15	0.34	0.47
	Sulfate (mg/L)	500	400	480	291
MW-08R	Arsenic (µg/L)	10	10	6.4	13
	Boron (mg/L)	3	2	40	53
	Manganese (mg/L)	0.3	0.15	0.22	0.42
	Sulfate (mg/L)	500	400	1500	1210
MW-03R	Arsenic (µg/L)	10	10	18	7.7
	Boron (mg/L)	3	2	2.0	5.0
MW-17	Boron (mg/L)	3	2	6.0	5.2
	Manganese (mg/L)	0.3	0.15	0.98	0.60
	Sulfate (mg/L)	500	400	1800	1270
MW-18	Boron (mg/L)	3	2	12	11
	Sulfate (mg/L)	500	400	1300	835
	Manganese (mg/L)	0.3	0.15	1.3	1.6
MW-02	Arsenic (µg/L)	10	10	23	11
MW-34	Arsenic (µg/L)	10	10	26	23
MW-21*	Arsenic (µg/L)	10	10	73	36

* BACKGROUND WELLS

eight times Illinois' groundwater standard in 2011 and over ten times that standard in 2017-2018. The contaminated groundwater is visibly seeping into the Middle Fork. The riverbank nearest the coal ash is stained brightly orange and has an oily sheen. Sampling of those coal ash seeps led Prairie Rivers Network to sue Dynegy for violations of the Clean Water Act, including unlawful discharges of arsenic, barium, boron, chromium, manganese, molybdenum and sulfate.

18.1 Compliance

The Illinois EPA has issued two violation notices to Dynegy for contamination from their coal ash ponds. In 2012, Dynegy received a groundwater quality violation. Dynegy received a second violation notice from Illinois EPA in 2018 for the coal ash-contaminated groundwater seeping into the Middle Fork of the Vermilion River. Illinois EPA and Dynegy have been going back and forth over a closure plan since the 2012 groundwater violation. Thus far, Dynegy has only released plans for closing the ash in place with a cap.

18.2 The Closure Plan at Vermilion Is Unlikely to Stop Contamination

Dynegy is proposing to cap the coal ash ponds and leave them in place. Capping the ash ponds will not stop the pollution of the site's groundwater and the river, and leaves the residents of Vermilion County with the permanent, grave risk that the meandering Middle Fork will erode the earthen dikes and allow the toxic ash to tumble into Illinois' only National Scenic River. Unless Illinois acts now to ensure excavation of that coal ash, the kayakers, tubers, and hikers enjoying the Middle Fork may head elsewhere for fear of contact with the polluted waters or a cascade of toxic ash.



REGION 4: SOUTHERN ILLINOIS

Southern Illinois is home to a myriad of water resources, including the confluence of the Mississippi River and the Ohio River near Cairo, IL. The lesser known Kaskaskia River starts all the way up in Champaign County and cuts across the state to meet the Mississippi over 300 miles away on the southern border of Illinois. The region is also home to multiple manmade lakes, including the Lake of Egypt near Marion, which provide water supply and recreation opportunities in the region.

The waters of Southern Illinois have numerous coal ash ponds on their shorelines. The mighty rivers that border Illinois have both have coal ash ponds, with four at the Wood River Site on the mighty Mississippi and one large pond plus a landfill at Joppa on the portion of the Ohio River that passes Illinois's border. The Kaskaskia River is quickly becoming the river with the most coal ash, as it has over four coal ash ponds at Baldwin and the rapidly filling coal ash landfill at Prairie State. The Marion Plant on the west shore of the Lake of Egypt has at least unlined one pond with coal ash.

19 BALDWIN

Dynegy owns and operates the Baldwin Energy Complex in southwestern Illinois, just outside its namesake Baldwin, IL. The power plant consists of three coal-fired units, but Dynegy “mothballed” (temporarily shut down) Unit 1 in 2016 and has considered shutting down Unit 3.⁴⁴

Over 13 million cubic yards of coal ash is stored at the site, enough to fill up the Empire State Building ten times. The coal ash ponds at Baldwin abut the Baldwin Cooling Lake Pond, a state fish and wildlife area, and discharges from the pond flow to the Kaskaskia River. Portions of the fly

ash ponds sit in the floodplain of the Kaskaskia River. All the ash ponds are unlined.⁴⁵

For purposes of compliance with the Coal Ash Rule, there are two coal ash units at Baldwin, a bottom ash pond and a set of three fly ash ponds—the East Fly Ash Pond, the Old East Fly Ash Pond, and the West Fly Ash Pond—which are considered a single unit. There are also a secondary and tertiary pond mentioned in Dynegy's coal ash rule filings.

The groundwater at Baldwin is unsafe. Dynegy's monitoring data from 2017 shows lithium in multiple wells

TABLE 19.1: THE GROUNDWATER AT BALDWIN IS UNSAFE FOR DRINKING

Well	Pollutant	Health threshold	Illinois Class I Groundwater Quality Standard	Mean concentration	Maximum concentration
MW-304*	Lithium (µg/L)	40		62.3	69.3
MW-356	Lithium (µg/L)	40		50.8	56.3
MW-370	Lithium (µg/L)	40		134.2	178.0
MW-382	Lithium (µg/L)	40		61.3	72.3
MW-375	Lithium (µg/L)	40		57.4	67.9
MW-377	Lithium (µg/L)	40		51.3	57.8
MW-391	Sulfate (mg/L)	500	400	721	758

*UPGRADIENT WELL



BALDWIN COAL ASH PONDS

at concentrations as high as 178 mg/l, nearly four times the safe level. One well also has unsafe levels of sulfate, with concentrations exceeding the health threshold and nearly double Illinois' standard.

Groundwater contamination at Baldwin has been ongoing for years. In 2012, Illinois EPA issued a violation notice for groundwater contamination, alleging violation of limits for boron, antimony, lead, iron, manganese, pH, sulfate, total dissolved solids, nitrate, and chloride. The violation notice remains unresolved. Additional groundwater monitoring data from 2010-2011 show unsafe levels of arsenic, boron, cobalt, manganese, and sulfate ([see Attachment D](#)), particularly in areas south and southwest of the ash ponds. The older data appear to be from wells that Dynegy does not sample for compliance with the coal ash rule. The groundwater contamination identified in 2010-2011 may still be a problem.

19.1 Compliance

According to Dynegy, Baldwin's bottom ash and fly ash pond are both in assessment monitoring due to SSIs for Appendix III detection monitoring pollutants, which likely included boron, calcium, chloride, fluoride, sulfate, and total dissolved solids.⁴⁶

Now that Baldwin is in assessment monitoring, Dynegy will have to compare concentrations of pollutants in groundwater at the site with groundwater protection standards established by EPA for each of the Appendix IV pollutants. Based on the available data, it appears that lithium will exceed its groundwater protection standard in one or more wells at the Bottom Ash Pond

([see Attachment C](#)).⁴⁷

19.2 The Closure Plan at Baldwin is Unlikely to Stop Contamination

Dynegy plans to cap and leave the coal ash in the coal ash ponds, and it has initiated the closure process with the Illinois EPA. Leaving more than thirteen million cubic yards of coal ash in place at Baldwin will do nothing to stop the leaching of toxic pollution into the groundwater at the site, rendering that groundwater unsafe for centuries to come.

TABLE 19.2: WELLS WITH LIKELY ASSESSMENT MONITORING SSIs

Downgradient well	Pollutants exceeding likely groundwater standard
BOTTOM ASH POND	
MW-370	Lithium

TABLE 20.1: THE GROUNDWATER AT JOPPA IS UNSAFE FOR DRINKING

Well	Pollutant	Health threshold	Mean concentration	Maximum concentration
G01D*	Cobalt (µg/L)	6	8.2	13.6
G51D	Cobalt (µg/L)	6	12.6	24.9
G54D	Cobalt (µg/L)	6	17.8	26.8
G107	Cobalt (µg/L)	6	13.6	95.2
	Lead (µg/L)	15	18.9	142.0
G109	Cobalt (µg/L)	6	6.7	40.2

*UPGRADIENT WELLS

20 JOPPA

Dynegy's Joppa Power Station, located on the southern border of Illinois along the Ohio River, has two coal ash dumps that Dynegy recognizes as regulated under the coal ash rule: one unlined ash pond located next to the power plant (the "East Ash Pond") and one relatively new landfill, located about one mile northwest of the plant.⁴⁸

The groundwater near both coal ash units has unsafe levels of cobalt, with concentrations as high as fifteen times the safe level. One well downgradient of the landfill (well G107) also has unsafe levels of lead. Cobalt is elevated in both up- and downgradient wells at the ash pond, but downgradient concentrations are higher than upgradient concentrations, suggesting that cobalt is leaching into the groundwater from the ash pond.

Groundwater monitoring data also shows evidence of coal ash impacts at both the ash pond and the landfill. At both ash dumps, the average concentrations of boron, calcium, chloride, and fluoride in one or more downgradient wells

exceeded the highest upgradient reading (see Attachment B). The same is true for total dissolved solids at the landfill. The ash pond results are not surprising, but the landfill, which did not yet contain any ash as of late 2016, is more of a mystery. The results may reflect other, historic contamination, or they may reflect contamination from newly placed ash, but in any case, the data do show coal ash impacts.

20.1 Compliance

Dynegy has only initiated assessment monitoring at the East Ash Pond, but should also conduct assessment monitoring at the landfill. Once in assessment monitoring, both units would show multiple SSIs, triggering corrective action at the landfill.

20.2 The Closure Plan at Joppa Is Unlikely To Stop Contamination

Dynegy is planning to close both units in place. Doing so will allow coal ash pollution of the groundwater to continue indefinitely.



JOPPA COAL ASH POND AND LANDFILL

TABLE 20.2: WELLS WITH LIKELY ASSESSMENT MONITORING SSIs AT JOPPA

Downgradient well	Pollutants exceeding likely groundwater standard
EAST ASH POND	
G51D	Lithium
G52D	Lithium
G54D	Cobalt, Lithium
LANDFILL	
G107	Beryllium, Cobalt
G109	Beryllium

TABLE 21.1: THE GROUNDWATER AT MARION IS UNSAFE FOR DRINKING

Well	Pollutant	Health threshold	Illinois Class I Groundwater Quality Standard	Mean concentration	Maximum concentration
EBG*	Lithium (µg/L)	40		41.4	82.0
EP-02	Cobalt (µg/L)	6	1000	16.8	52.0
EP-03	Cobalt (µg/L)	6	1000	99.8	120.0
EP-04	Arsenic (µg/L)	10	10	42.0	53.0
	Boron (mg/L)	3	2	14.0	23.0
	Cobalt (µg/L)	6	1000	400.0	440.0
	Selenium (µg/L)	50	50	138.8	200.0
	Thallium (µg/L)	2	2	96.4	300.0

21 MARION

The Marion Power Plant is operated by the Southern Illinois Power Cooperative (SIPC) in Marion, Illinois, where it abuts a popular boating and fishing lake, Lake of Egypt. Although the site has one inactive landfill,⁴⁹ appears to have multiple impoundments,⁵⁰ and has at least one fly ash pond,⁵¹ for purposes of the coal ash rule SIPC is only monitoring a very small, unlined ash pond, one acre in size and eight feet deep, known as the “Emery Pond.”⁵² The company claims that these ponds do not store coal ash,⁵³ but US EPA documents identify many of the ponds as ash ponds.⁵⁴

Groundwater at the Marion site is unsafe. SIPC’s testing of groundwater underlying the Emery Pond shows unsafe levels of multiple pollutants, including arsenic, boron, cobalt, selenium, lithium and thallium. The data show



MARION COAL ASH POND

arsenic at concentrations more than five times safe levels, boron at concentrations nearly eight times the health threshold and just short of twelve times Illinois’ standard, cobalt at more than seventy times safe levels, lithium at concentrations more than double safe levels, selenium at concentrations quadruple safe levels, and thallium (formerly used as rat poison) at concentrations up to one hundred and fifty times safe levels. In one monitoring well, EP-04, cobalt and thallium concentrations are, on average, about fifty or sixty times higher than safe levels.

The monitoring results, which compare downgradient to upgradient wells, suggest that the Emery Pond is the source of the contamination.

21.1 Compliance

SIPC found detection monitoring SSIs for boron in every sampling event at three of the downgradient wells (wells EP-01, EP-02 and EP-04) and SSIs for total dissolved solids in every sampling event at all four downgradient wells. SIPC has posted a notice that it will begin

TABLE 21.2: WELLS WITH LIKELY ASSESSMENT MONITORING SSIs AT MARION’S EMERY POND

Downgradient well	Pollutants exceeding likely groundwater standard
EP-01	Cadmium
EP-02	Cobalt
EP-03	Cobalt
EP-04	Arsenic, Cadmium, Cobalt, Lead, Selenium, Thallium

conducting assessment monitoring. When it does, it will find SSIs for multiple pollutants.

The Emery Pond is a small portion of the total Marion property. The condition of groundwater around the rest of the property is largely a mystery. EIP’s Ashtracker database has a limited amount of information for nine wells located north and south of the power plant.⁵⁵ These data cover the 2010-2011 time period and include just three pollutants—boron, cadmium and sulfate. Although the data do not show long-term exceedances of health-based thresholds, they do show elevated levels of boron, particularly in well S2 at the northern edge of the site, suggesting that coal ash has contaminated more of the site than SIPC’s limited documentation indicates. Until SIPC implements a more robust groundwater monitoring program, and in light of the evidence of discussed above, the public should assume that there is contamination across the site.

The mystery of Marion’s multiple “ash ponds”, which the company claims do not contain coal ash, highlights the need for regulations which track the distribution and reuse of coal ash. A power plant can distribute their ash

to other entities which reuse the ash, but this activity is not tracked. If the ponds are indeed empty, the ash could have been put somewhere else, such as in a mine or used as structural fill for roads, but the public has no way of knowing what happened to it.

21.2 The Closure Plan at Marion

SIPC has failed to post a closure plan for the Emery pond, in violation of the coal ash rule, so it is unclear whether SIPC will remove the toxic ash from that pond—or the other ponds on site—or leave it in place, allowing continued contamination for centuries to come.

22 PRAIRIE STATE

The Prairie State Energy Campus is a 1766 megawatt coal plant—the largest in Illinois—near Marissa, Illinois, about 36 miles southeast of St. Louis. Owned and operated by Prairie State Generating Company (“Prairie State”), the facility dumps its coal ash in a massive, 750-acre coal ash landfill known as the “Near Field Facility.” The power plant has been in operation for only six years, but the landfill already stores almost twelve million cubic yards of coal ash. Despite operating for a brief time, this is a huge amount of ash, already the second largest in the state

TABLE 22.1: THE GROUNDWATER AT PRAIRIE STATE IS UNSAFE FOR DRINKING

Well	Pollutant	Health threshold	Illinois Class I Groundwater Quality Standard	Mean concentration	Maximum concentration
G02D*	Arsenic (µg/L)	10	10	23.1	26.9
MW203*	Arsenic (µg/L)	10	10	35.9	51.7
G04D	Arsenic (µg/L)	10	10	15.4	18.9
G05D	Arsenic (µg/L)	10	10	35.0	52.0
G06D	Arsenic (µg/L)	10	10	32.1	42.4
G07D	Arsenic (µg/L)	10	10	40.4	46.1
G08D	Arsenic (µg/L)	10	10	33.4	40.2
G09D	Arsenic (µg/L)	10	10	28.3	136.0
	Cobalt (µg/L)	6	1000	20.1	131.0
	Lead (µg/L)	15	7.5	34.1	234.0
G10D	Arsenic (µg/L)	10	10	21.4	27.7
G17D	Cobalt (µg/L)	6	1000	7.2	13.6
G20D	Arsenic (µg/L)	10	10	15.7	17.1
R11D	Arsenic (µg/L)	10	10	21.5	27.9

*UPGRADIENT WELLS



PRAIRIE STATE COAL ASH LANDFILL

by volume. Prairie State has added nearly three million cubic yards of coal ash each of the past two years. To put number that into perspective, Prairie State is making more coal ash each year than the amount stored at most facilities over their entire multi-decade operating life.

The groundwater around the landfill already is unsafe, with arsenic at concentrations as high as thirteen times safe levels, cobalt at concentrations nearly twenty-two times safe levels, and lead at concentrations as high as fifteen times the health threshold and thirty-one times Illinois' standard. Some or all of the arsenic may be naturally occurring, as it occurs at roughly the same levels in both up- and downgradient wells. The cobalt and lead are probably due to contamination from the landfill. The clearest evidence of contamination is in well G09D, on the southern edge of the landfill near New Marigold Road. This well also has the highest onsite concentrations of the coal ash indicator boron, suggesting that the contamination is being caused by coal ash.

TABLE 22.2: WELLS WITH LIKELY ASSESSMENT MONITORING SSIs AT PRAIRIE STATE

Downgradient well	Pollutants exceeding likely groundwater standard
G09D	Barium, Beryllium, Cadmium, Chromium, Cobalt, Lead, Lithium, Thallium
G17D	Cobalt
G20D	Cobalt
R11D	Cobalt

22.1 Compliance

The landfill should be in assessment monitoring because calcium, chloride, sulfate, and total dissolved solids all appear to be significantly elevated in downgradient wells, but Prairie State has not posted a notice of assessment monitoring. Once in assessment monitoring, Prairie State will likely find several SSIs, particularly in well G09D, which would then trigger corrective action.

23 VENICE

The Venice Station in has not burned coal since the mid-1970s, and it is not regulated by the Coal Ash Rule, but other data suggest that the site's unlined ash ponds continue to contaminate groundwater. EIP's ashtracker website includes sampling results from 2011 that show unsafe levels of arsenic, boron, manganese, and sulfate on the edge of the Mississippi River. The closure plan for the site—the only closure plan made available on Illinois EPA's website⁵⁶—notes that the coal ash is in contact with the groundwater. Illinois EPA reports that the ash ponds were capped.⁵⁷ If ash remains in contact with groundwater at the site, toxic contaminants will continue to leach into groundwater indefinitely.

24 WOOD RIVER

Dynegy's retired Wood River Power Plant has at least four coal ash ponds that collectively store over one and a half million cubic yards of coal ash. The ash ponds are located in Alton next to the Mississippi River and Wood River, one of its tributaries. It appears that none of these ash ponds is lined.⁵⁸ The Primary Ash Pond contains coal ash, within coal ash, on top of coal ash: it was built on top of ash and its berms are made of ash as well.⁵⁹



WOOD RIVER COAL ASH PONDS

TABLE 24.1: THE GROUNDWATER AT WOOD RIVER IS UNSAFE FOR DRINKING

Well	Pollutant	Health threshold	Illinois Class I Groundwater Quality Standard	Mean concentration	Maximum concentration
2	Boron (mg/L)	3	2	3.2	4.5
4	Arsenic (µg/L)	10	10	39.3	50.1
25*	Arsenic (µg/L)	10	10	11.7	57.4
	Lithium (µg/L)	40		40.5	65.4
31*	Lithium (µg/L)	40		96.4	171.0
34	Arsenic (µg/L)	10	10	21.2	42.0
38	Boron (mg/L)	3	2	4.5	6.9
39S	Boron (mg/L)	3	2	60.9	69.6
	Molybdenum (µg/L)	100		517	857
	Sulfate (mg/L)	500	400	745	860
40S	Boron (mg/L)	3	2	24.3	27.5
	Molybdenum (µg/L)	100		105	189
	Sulfate (mg/L)	500	400	548	609
41	Boron (mg/L)	3	2	8.9	10.6
	Sulfate (mg/L)	500	400	536	620

*UPGRADIENT WELLS

The groundwater at Wood River is unsafe, with dangerously elevated concentrations of arsenic, boron, lithium, molybdenum, and sulfate. Groundwater testing has revealed arsenic at concentrations nearly six times safe levels, boron at concentrations as high as twenty-three times the health threshold and nearly thirty five times Illinois' groundwater standard, molybdenum at concentrations nearly nine times safe levels, and sulfate at concentrations seventy-two percent over the health threshold and more than double Illinois' standard.

24.1 Compliance

The high boron and sulfate concentrations are a clear fingerprint of coal ash contamination, and Dynegy has initiated assessment monitoring around all four ash ponds. In assessment monitoring, Dynegy is likely to find SSIs for molybdenum in multiple wells around the Primary East Ash Pond.

24.2 The Closure Plan at Wood River Is Unlikely to Stop Contamination

Dynegy is planning to close all ash ponds in place. They submitted a closure plan to the Illinois EPA in 2016, and are seeking changes to their NPDES permit to discharge water that they will pump out of the ponds to close them. Dynegy's plan will do not stop the ongoing flow of dangerous contamination into groundwater and the Wood River.



ENVIRONMENTAL JUSTICE AT ILLINOIS' COAL ASH SITES

Nationwide, the burden of coal ash pollution is carried disproportionately by communities of color and low-income communities. This is also true at many coal plants in Illinois, where populations of people of color are higher than the state average at a quarter of coal ash sites and populations of low-income residents are equal to or higher than the state average at nearly eighty percent (19 of the 24) sites.

At 18 of the 19 plants with average or above-average low-income populations, groundwater contamination will likely persist after closure of the ash ponds because those ponds will be closed in place or because saturated ash will remain at the site. Those include Baldwin, Coffeen, Dallman, Duck Creek, Edwards, Havana, Hennepin, Hutsonville, Joppa, Kincaid, Joliet 29, Joliet 9/Lincoln Stone Quarry, Meredosia, Pearl, Powerton, Waukegan, Wood River and Venice.

TABLE 25: DISPROPORTIONATE IMPACT WITHIN THREE MILES OF ILLINOIS COAL ASH DUMPS⁶⁰

Estimate of Proportion of Population within 3 miles	Minority Population	Low Income Population
Baldwin	2%	32%
Coffeen	11%	46%
Crawford	92%	59%
Dallman	34%	38%
Duck Creek	2%	34%
Edwards	4%	33%
Havana	3%	48%
Hennepin	54%	49%
Hutsonville	2%	31%
Joliet 29	53%	37%
Joppa Steam	9%	43%
Kincaid	8%	34%
Joliet 9/Lincoln Stone Quarry	59%	41%
Marion	9%	20%
Meredosia	1%	49%
Newton	0%	16%
Pearl	1%	46%
Powerton	8%	34%
Prairie State	1%	9%
Waukegan	79%	51%
Will County	32%	21%
Woodriver	14%	45%
Venice	82%	66%
Vermilion	5%	24%
Illinois State Average	38%	31%

BOLDED TEXT PERCENTAGES INDICATE VALUES ABOVE THE STATE AVERAGE.



CONCLUSION AND RECOMMENDATIONS

Illinois' groundwater has been severely harmed by coal ash pollution, and the water remains at risk. If coal ash remains in contact with groundwater and timely cleanups are not completed, contamination will continue to endanger sources of drinking water as well as nearby lakes and rivers. This pollution disproportionately impacts low income communities. The widespread nature of the pollution threatens to harm the quality of life for all Illinoisans who value clean water and healthy rivers and lakes.

Via a revived coal ash rulemaking, legislation, or some combination of both, Illinois must address the problem of coal ash contamination now, before it does greater damage to our communities and waters. Illinois must accomplish the following:

- Put in place standards that permanently stop the pollution from all ash dumps in the state, whether operating or abandoned.
- Prohibit the dumping or burying of coal ash in places where it remains in contact with groundwater. Require dry handling and disposal of coal ash. The only way to prevent contamination from coal ash is to keep the coal ash contained and dry.
- Ensure the public an opportunity to participate meaningfully in permitting decisions and all other evaluations of compliance with required safeguards at these dumps, starting before a dump is built and continuing throughout operation, closure, and even after the dump is closed. Coal ash dumps are too dangerous for decisions about them to be made behind closed doors.
- Ensure that the public has access to information about what happens to coal ash generated or stored in Illinois.
- Hold polluters accountable for the toxic messes they have made. Require owners of coal ash dumps to set aside money for cleanup and rehabilitation of the lands and waters fouled by ash dumps. Illinois residents must not be left holding the bag.
- Illinois has an opportunity to protect its water resources by administering an effective state permit program. The goals of its program must be crystal clear — to protect both the health of Illinois residents and the quality of their water. The quality of Illinois' safeguards will determine the quality of its water. Lack of adequate rules will result in continuing and worsening water contamination. The problems identified in this report need real solutions and firm resolve on the part of state leaders and citizens to demand an end to the pollution of Illinois water by leaking toxic coal ash dumps.

ENDNOTES

- 1 U.S. EPA Administrator published the Disposal of Coal Combustion Residuals from Electric Utilities final rule in the Federal Register on April 17, 2015. This rule finalized national regulations to provide a comprehensive set of requirements for the safe disposal of coal ash from coal-fired power plants. See <https://www.federalregister.gov/documents/2015/04/17/2015-08257/hazardous-and-solid-waste-management-system-disposal-of-coal-combustion-residuals-from-electric>.
- 2 There are twenty five sites in Illinois. Groundwater data for Grand Tower was not available to the authors of the report at this time.
- 3 The coal ash rule defines ash impoundments (or ponds) as unlined if they cannot meet the rule's liner design standards. For existing impoundments, the design standards require a very low conductivity "composite liner" made up of clay plus a geomembrane (plastic) liner, or an "alternative composite liner" with similarly low conductivity. 40 C.F.R. § 257.71; Util. Solid Waste Activities Grp. v. Envtl. Prot. Agency, 901 F.3d 414, 432 (D.C. Cir. 2018) (vacating provision considering solely clay-lined impoundments to be lined). New impoundments and landfills must have a composite liner, with a lower component equivalent to the prescribed clay liner and an upper, geomembrane component. 40 C.F.R. §§ 257.70, 257.72. Owners of coal ash units are required to certify that their liner meets the rule's design criteria. If a liner does not meet the prescribed criteria, or if an owner fails to certify the liner, then the rule defines that ash pond as "unlined."
- 4 40 C.F.R. Part 257. "CCR" is an acronym for coal combustion residuals, another way of saying coal ash.
- 5 This report also discusses groundwater data not collected for compliance with the federal coal ash rule in several instances. For some ash dumps located at power plants closed before the coal ash rule took effect, such as Crawford, Hutsonville, Meredosia, Venice, and Vermilion, no groundwater monitoring was performed to comply with the rule. Thus, the only data available for those sites is older and often includes fewer, or different, pollutants, but it nonetheless helps to illuminate the extent and nature of coal ash pollution of Illinois' groundwater. For certain coal ash dumps that are covered by the rule, groundwater monitoring mandated by the State has been broader and more longstanding than the data collected for the rule, and presenting it here provides a more complete picture of the extent and severity of coal ash contamination at those sites.
- 6 This figure includes existing clay-lined ponds, which were originally defined as lined, but must now be considered unlined in light of the recent D.C. Circuit decision. See supra, n. 2.
- 7 The court's decision also made clear that ash ponds underlain with clay do not qualify as "lined" ash ponds – so are to be treated as all other unlined ash ponds under the rule – and that ash ponds at power plants that shut down before October 2015 must be regulated as well. See Util. Solid Waste Activities Grp., 901 F.3d at 432-34.
- 8 EPA proposed adding boron to Appendix IV (assessment monitoring), recognizing that boron is one of the leading risk drivers associated with coal ash contamination, but has not yet acted on that proposal. 83 Fed. Reg. 11584 (Mar. 15, 2018).
- 9 U.S. EPA, 2018 Edition of the Drinking Water Standards and Health advisories Tables. <https://www.epa.gov/sites/production/files/2018-03/documents/dwtable2018.pdf>.
- 10 Id.
- 11 EIP's Ashtracker website uses a different approach, and considers groundwater to be unsafe if it exceeds a health-based threshold at least once. We are using mean values in order to emphasize the pollutants that are most likely to present long-term, unambiguous health threats.
- 12 Under Illinois law, "Class I" groundwater is "potable resource groundwater," that is, groundwater "generally fit for human consumption in accordance with accepted water supply principles and practices." See 35 Ill. Admin. Code §§ 620.110, 620.210. Illinois bars contamination in Class I groundwater above groundwater quality standards. Id. at §§ 620.405, 620.410(a).
- 13 The groundwater standard for each pollutant is either this presumptive standard or the site-specific background value, whichever is greater.
- 14 Except due to "natural causes." 35 Ill. Admin. Code § 620.410(e).
- 15 EIP's Ashtracker website uses a different health-based threshold for molybdenum, 40 µg/L, which is EPA's lifetime health advisory for this pollutant. 100 µg/L is the EPA Regional Screening Level for molybdenum. Both are health-based and scientifically sound. We chose to use 100 µg/L for this report because it is consistent with the new groundwater protection standard under the Coal Ash Rule.
- 16 Groundwater data for Grand Tower, which is closed but has coal ash, was not available or not reviewed for this report. Groundwater at these sites may be contaminated by coal ash.
- 17 Data from 2012. The coal ash pond at Crawford has since been closed by removal of the ash. We don't have access to more current groundwater monitoring.
- 18 See, e.g., ENSR, Phase II Environmental Site Assessment for the Waukegan Generating Station (Nov. 1998) (showing the "former slag / fly ash storage area").
- 19 Ponds 1N and 1S still contain coal ash and are open to precipitation, so they continue to impound both coal ash and water. This renders them "inactive surface impoundments," regulated as all other unlined ash ponds under the coal ash rule.
- 20 See Patrick Engineering, Hydrogeologic Assessment Report for the Will County Generating Station (Feb. 2011) (showing "coal ash" and "coal cinders" in the boring logs for wells MW-1, MW-2, MW-3, MW-4, and MW-6).
- 21 See PCB No. R.14-10, In the Matter of: Coal Combustion Waste (CCW) Surface Impoundments at Power Generating Facilities: Proposed New 35 ILL. ADM. CODE 841, "Illinois EPA's Response to Questions Posed by the Board," dated Mar. 6, 2017, available at <https://pcb.illinois.gov/documents/dsweb/Get/Document/946651>, at 5.
- 22 See, e.g., ENSR Consulting, Phase II Environmental Site Assessment for the Joliet #29 Generating Station, Fig. 3 (Dec. 1998) (showing "ash landfills" on the southwest and northeast corners of the property, and Ash Ponds 1, 2 and 3 in the center of the property). Midwest Generation stopped using Ash Ponds 1 and 3 before the effective date of the CCR rule.
- 23 Dynegy was purchased by Vistra in 2018.
- 24 https://www.dynegy.com/sites/default/files/ccr/Illinois/Duck-Creek/Doc_636553247031163492.pdf.
- 25 The well appears to be located adjacent to a rail loop. At one point there was an ash pond known as the "recycle pond" within that rail loop. See https://www.dynegy.com/sites/default/files/ccr/Illinois/Duck-Creek/Doc_636143690223126300.pdf; see also https://archive.epa.gov/epawaste/nonhaz/industrial/special/fossil/web/pdf/ameren_dc_final.pdf. The recycle pond now appears to be dry. If any coal ash was left in place when the recycle pond was closed, then it, or any other coal ash buried within the rail loop, may still be contaminating groundwater.
- 26 https://www.dynegy.com/sites/default/files/ccr/Illinois/Edwards/Doc_636143704112885028.pdf; https://www.dynegy.com/sites/default/files/ccr/Illinois/Edwards/Doc_636227709066835873.pdf (showing groundwater elevations in onsite piezometers at 441-451 feet, and a minimum coal ash elevation – presumably reflecting the top of the coal ash at its lowest point – of 433 feet).
- 27 https://www.dynegy.com/sites/default/files/ccr/Illinois/Edwards/Doc_636143705858212097.pdf.
- 28 See <https://pcb.illinois.gov/documents/dsweb/Get/Document/946651>. See page 27 in the PDF. Moreover, because Dynegy did not post liner documentation for the west ash ponds, they are, for purposes of the coal ash rule, unlined. See 40 C.F.R. § 257.71(a)(3)(ii).
- 29 Closure Plan, Fly Ash Pond and Bottom Ash Pond, Meredosia Power Station 2016 PDF Page 5 https://drive.google.com/a/prairiepower.org/file/d/0B_Ym1O7ZAK2NYjdDbGxkdzFES0k/view?usp=sharing.
- 30 Hydrogeologic Assessment Report, Fly Ash Pond and Bottom Ash Pond, Meredosia Power Station 2016 PDF Page 195 https://drive.google.com/a/prairiepower.org/file/d/0B_Ym1O7ZAK2NYjV3TjNjUkx1UaE6/view?usp=sharing.
- 31 Violation Notice: Prairie Power Inc, Pearl Station. December 6, 2102
- 32 <https://drive.google.com/file/d/1Q12YpBbNjhaWjgmAIPrZFVWj-z4hHdQ4t/view>.
- 33 See, e.g., ENSR, Phase II Environmental Site Assessment for the Powerton Generating Station (Dec. 7, 1998) (including nine boring logs that show "coal/slag," "slag/coal," or "slag" up to sixteen feet deep; slag is a form of coal ash); see also Patrick Engineering, Hydrogeologic Assessment Report for the Powerton Generating Station (Feb. 2011) (including seven boring logs that show "coal cinders" up to 24.5 feet deep).
- 34 Letter from Richard R. Gnat, KPRG, to Lynn Dunaway, Illinois EPA, re: Midwest Generation, LLC, Powerton Generating Station; ID No. 6282, Compliance Commitment Agreement - ELUC/GMZ (Sept. 11, 2013).
- 35 Id.
- 36 See http://3659839d00aefa48ab17:3929cea8f28a01ac3cb6bbf40cac69f0.r20.cf1.rackcdn.com/PQW_ASB_GMV.pdf, dated August 22, 2018.
- 37 https://www.dynegy.com/sites/default/files/ccr/Illinois/Coffeen/Doc_636143663485517226.pdf.
- 38 Hydrogeologic Site Characterization Report, Ash Pond 2, Coffeen Power Station. Report Page 3-5, PDF Page 24 12.5 kg/day + 1.6 kg/day is 11,000 lbs per year. https://drive.google.com/a/prairiepower.org/file/d/0B_Ym1O7ZAK2NQGxAM1kycElzZmM/view?usp=sharing.
- 39 Flue gas desulfurization waste, also known as "scrubber sludge," is coal ash generated by air pollution control devices ("scrubbers") that remove sulfur dioxide from flue gas.
- 40 <https://www.cwlp.com/CCRPDFHandler.aspx?imgID=11>.
- 41 See <https://www.dnr.illinois.gov/Parks/Pages/SangreChisLake.aspx>.
- 42 Dynegy's coal ash rule documentation reveals a second ash pond, the "secondary pond," just south of the primary ash pond. See Dynegy, History of Construction for the primary ash pond, https://www.dynegy.com/sites/default/files/ccr/Illinois/Newton/Doc_636143831378739291.pdf?ts=6366381620Q05858242, at pdf p.7 (noting that the "Operation and Maintenance Manual for Primary and Secondary Ash Ponds" is included as Appendix D). The company's documentation further shows that the landfill is, in fact, two separate small landfills. See https://www.dynegy.com/sites/default/files/ccr/Illinois/Newton/Doc_636553253095628297.pdf?ts=636638162373053587, at pdf p. 38. Still, the name of "Landfill 2" suggests that there are or were other landfills at Newton.
- 43 As noted above, the D.C. Circuit Court decision in August 2018 directed EPA to regulate "inactive" ash ponds at "inactive" – i.e., retired – power plant sites, such as Vermilion. EPA has not yet issued a revised coal ash rule to regulate those old ash ponds.
- 44 <http://www.randolphcountytribune.com/news/20161012/dynegy-delays-mothballing-unit-1-at-baldwin>.
- 45 Dynegy confirmed in its coal ash rule filings that both the Bottom Ash Pond and the West Fly Ash Pond are not lined. The company did not post any liner certifications for the East Fly Ash Pond or the Old East Fly Ash Pond, so those are considered unlined under the coal ash rule.
- 46 As shown in detail in Attachment B, all of these pollutants had mean concentrations in one or more downgradient wells that exceeded the highest upgradient result.
- 47 For example, lithium concentrations in downgradient well MW-370 average 134 µg/L, more than three times higher than the presumptive groundwater standard of 40 µg/L and roughly twice as high as any upgradient results.
- 48 As of late 2016, the landfill had not received any coal ash. See CCR Landfill Closure and Post-closure Plan (Oct. 2016), https://www.dynegy.com/sites/default/files/ccr/Illinois/Jappa/Doc_636143824305423754.pdf.
- 49 http://sipower.org/p/Landfill_Closure_Notification.pdf.
- 50 See aerial photograph and groundwater wells monitored pursuant to state law on EIP's Ashtracker website: <https://ashtracker.org/facility/87/madison-power-plant>.
- 51 An engineering report posted on the SIPC website refers to "the plant's south fly ash pond." See Clarida and Ziegler Engineering Co., Engineering Report for Coal Combustion Residual Surface Impoundment Emery Pond at 1 (Oct. 17, 2016), http://sipower.org/jm/pdfs/Engineering_Report_H_H_Capacity_Assessments_October_2016.pdf.
- 52 Clarida and Ziegler Engineering Co., Engineering Report for Coal Combustion Residual Surface Impoundment Emery Pond (Oct. 17, 2016), http://sipower.org/jm/pdfs/Engineering_Report_H_H_Capacity_Assessments_October_2016.pdf.
- 53 Comments by Southern Illinois Power Company to the Illinois Pollution Control Board <https://pcb.illinois.gov/documents/dsweb/Get/Document/946651>.
- 54 https://archive.epa.gov/epawaste/nonhaz/industrial/special/fossil/web/pdf/sipc_madison_final.pdf.
- 55 <https://ashtracker.org/facility/87/madison-power-plant>.
- 56 AmerenUE Venice Station Ash Pond <https://www2.illinois.gov/epa/topics/water-quality/watershed-management/ash-impoundment/Pages/amerenue-venice-station.aspx>.
- 57 See PCB No. R.14-10, In the Matter of: Coal Combustion Waste (CCW) Surface Impoundments at Power Generating Facilities: Proposed New 35 ILL. ADM. CODE 841, "Illinois EPA's Response to Questions Posed by the Board," dated Mar. 6, 2017, available at <https://pcb.illinois.gov/documents/dsweb/Get/Document/946651>, at 5.
- 58 Dynegy has not posted required certifications concerning ash pond liners at Wood River, so for purposes of the coal ash rule, all ash ponds at the site are considered unlined.
- 59 See History of Construction, Wood River, at pp. 3-4, available at https://www.dynegy.com/sites/default/files/ccr/Illinois/Wood-River/Doc_636143835538464427.pdf.
- 60 EPA, EJSCREEN (retrieved Oct. 2018), www.epa.gov/ejscreen.